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***Superfund Record of Decision
Final***

***Soil Operable Unit Sites and Groundwater
Operable Unit Plumes***

***Mather Air Force Base
Sacramento County, California***

April 29, 1996

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List of Acronyms

AC&W	Aircraft Control and Warning
AFB	Air Force Base
AGE	Aerospace Ground Equipment
ARAR	Applicable or Relevant and Appropriate Requirement
ASC	Additional Site Characterization
AST	aboveground storage tank
ATC	Air Training Command
AWQC	Ambient Water Quality Criteria
bls	below land surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
COC	contaminant of concern
COPC	contaminant of potential concern
CVR	Central Valley Region
CVRWQCB	Central Valley Regional Water Quality Control Board
D.I.	deionized
DCE	dichloroethene
DLM	Designated Level Methodology
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
ESD	Explanation of Significant Difference
FFS	Focused Feasibility Study
FR	Federal Register
FS	feasibility study
gpm	gallons per minute
HWCL	Hazardous Waste Control Law
IRP	Installation Restoration Program
JETC	jet engine testing cell
JP-4	jet propellant fuel
LCRS	leachate collection and removal systems

List of Acronyms (Continued)

MBRA	Mather Baseline Risk Assessment
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NCP	National Contingency Plan
NPL	National Priorities List
OU	operable unit
OWS	oil/water separator
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	perchloroethene (tetrachloroethene)
POL	petroleum, oil, and lubricant
POTW	publicly owned treatment works
ppm	parts per million
PTU	post-treatment unit
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
ROD	Record of Decision
SAC	Strategic Air Command
SARA	Superfund Amendments and Reauthorization Act of 1986
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SVE	soil vapor extraction
SWRCB	State Water Resources Control Board
TBC	to-be-considered
TCE	trichloroethene
TDL	total designated level
TPH	total petroleum hydrocarbons
TSCA	Toxic Substance Control Act
UCL	upper confidence level
USAF	United States Air Force
USEPA	United States Environmental Protection Agency

List of Acronyms (Continued)

UST	underground storage tank
WDR	Waste Discharge Requirement
WET	waste extraction test
WQG	water quality goal
yd ³	cubic yards

1.0 Introduction

This decision document presents the selected remedial actions for the Soil Operable Unit (OU) Sites and Groundwater OU Plumes, at the formerly active Mather Air Force Base (AFB), Sacramento County, California. The selected remedial actions were developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). These decisions, documented herein, are based on the information contained in the Administrative Record File for the subject sites and plumes. The Administrative Record Index (Appendix A) identifies documents that were considered or relied upon to make these decisions.

The purpose of this Record of Decision (ROD) is to decide the appropriate level of remediation necessary to protect human health and the environment, and determine what requirements are applicable or relevant and appropriate requirements (ARARs) based on the groundwater beneficial use designation and site-specific conditions.

This ROD has been divided into seven sections which specifically address the range of selected remedial actions for the Soil OU sites and Groundwater OU plumes. These seven sections are:

- Section 1.0 - Introduction:
 - This section presents a summary of the selected remedial alternatives, as well as signatures of concurrence by the United States Air Force (USAF), United States Environmental Protection Agency (USEPA), and the State of California.
- Section 2.0 - Soil OU Sites Selected for Remedial Action:
 - This section of the ROD documents the remedial actions selected for soil sites where cleanup is warranted.
- Section 3.0 - Soil OU Sites Selected for No Further Action:
 - This section of the ROD documents the decision that no action is warranted at these soil sites since conditions pose no current or potential threat to human health or the environment.

- Section 4.0 - Soil OU "Petroleum Only" Sites Selected for No Action Under CERCLA (but remain to be closed under other regulations):
 - This section of the ROD documents the decision that no action is warranted under CERCLA, since CERCLA does not provide the appropriate legal authority to undertake a remedial action at these soil sites. The no action decision does not constitute a finding that adequate protection has been achieved at the sites. Cleanup alternatives have been developed and will be implemented under the Resource Conservation and Recovery Act (RCRA) Subtitle I, other appropriate State of California regulations, and the Defense Environmental Restoration Program.
- Section 5.0 - Groundwater OU Plumes Selected for Remedial Action:
 - This section of the ROD documents the remedial actions for the groundwater plumes.
- Section 6.0 - Listing of ARARs:
 - This section describes all federal and state ARARs required to be complied with under this ROD.
- Section 7.0 - Responsiveness Summary:
 - This section contains comments received during the public comment period and responses to these comments.

Each section is addressed in its entirety in this ROD. The Soil OU sites and Groundwater OU plumes selected for remedial action (Sections 2.0 and 5.0) are the main focus of this ROD. This ROD addresses all compliance requirements under CERCLA. Any CERCLA sites at Mather AFB not addressed in this ROD, or previous Mather AFB RODs, will be addressed in the Final OU ROD.

1.1 Site Background

The formerly active Mather AFB is located in the Central Valley region of northern California in Sacramento County, approximately ten miles east of downtown Sacramento, California and due south of unincorporated Rancho Cordova, California, as shown on Figure 1-1.

Figure 1-1. The base is due south of U.S. Highway 50, a major highway connecting Sacramento and South Lake Tahoe. The formerly active base encompassed approximately 5,845 acres at the time of closure (129 acres of easements) in an unsurveyed part of Township 8 North, Ranges 6 East and 7 East. Mather AFB was constructed in 1918 and its primary mission was as a flight training school. The base was decommissioned under the Base Closure and Realignment Act on September 30, 1993.

Contamination exists at Soil OU sites and Groundwater OU plumes as a result of past USAF operations conducted between 1918 and 1993. The Soil OU is comprised of contaminated soils associated with waste disposal pits, oil/water separators (OWS), gas stations, underground storage tanks (USTs), fire training areas, and other miscellaneous sites. The Groundwater OU consists of contaminated groundwater plumes beneath and within the immediate vicinity of the base with the exception of the Aircraft Control and Warning (AC&W) OU plume. The main sources of contamination at the Soil OU sites and Groundwater OU plumes include industrial activities, equipment maintenance, fire suppression training, and fuels storage and delivery.

Installation Restoration Program (IRP) activities at the formerly active base have been conducted since 1982. These previous investigations have confirmed the presence of volatile organic compounds and other hydrocarbons at several of the IRP sites. Based on this, the entire base was proposed for listing on the Superfund (CERCLA) National Priorities List (NPL) in July 1989, and was placed on the NPL on November 21, 1989. In July 1989, the USAF, the USEPA, and the State of California signed a Federal Facility Agreement under CERCLA Section 120 to ensure that environmental impacts from past and present operations are thoroughly investigated and appropriate cleanup actions are taken to protect human health, welfare, and the environment. The Federal Facility Agreement sets enforceable deadlines for documents, defines roles and responsibilities of each signatory party, and provides a vehicle for dispute resolution. The USAF is the owner of the site, the principal responsible party, and lead agency for conducting investigative and cleanup activities. There have been no CERCLA enforcement actions at the Soil OU sites or Groundwater OU plumes.

The Group 2 Sites Remedial Investigation (RI) Report [IT 1992a], the Group 3 Sites Technical Memorandum [IT 1993a], and the Additional Field Investigation Report [IT 1994a] became available to the public at the Mather Environmental Management Office in 1993 and 1994. The Groundwater OU and Soil OU Focused Feasibility Study (FFS) Report [IT 1995a] became available to the public in 1995. Each of these documents and the Proposed Plan for the Groundwater OU Plumes and Soil OU Sites [IT 1995b] are part of the Administrative Record File and are available for review at the following information repositories:

- the Environmental Management Office, Mather AFB;
- the Sacramento Central Library; and
- the Rancho Cordova Community Library.

Formal request for public comment on the Proposed Plan [IT 1995b] and FFS Report [IT 1995a] was published in the *Sacramento Bee* on May 1, 1995.

The public comment period extended from May 8, 1995 through June 7, 1995, to afford the public a chance to comment on the Proposed Plan and the supporting RI/Feasibility Study (FS) reports. A public meeting was held at Mather AFB (Building 2460) on May 18, 1995. Representatives from the USAF, the USEPA Region IX, the California Regional Water Quality Control Board, and the California Department of Toxic Substances Control (DTSC) were present at the meeting. Representatives from the USAF and regulatory agencies answered questions about the Soil OU sites and Groundwater OU plumes and the remedial alternatives under consideration. The Responsiveness Summary, Section 7.0 of this ROD, contains comments received during the public comment period and responses to these comments.

An informal dispute was invoked concerning the cleanup of VOCs in the vadose zone. The parties to the FFA resolved the dispute as reflected in Sections 2.2.9.1 (Site 7/11), 2.2.9.5 (Site 37/39/54), and 2.2.9.7 (Site 57). The resolutions are negotiated solutions that are not generally applicable to other sites except those at this facility.

The USAF, the USEPA Region IX, and the State of California concur with the selected remedial actions (which are presented in Tables 1-1 and 1-2 and detailed in Sections 1.1.1 and 1.1.2) and statutory determinations for each of the separate sections of this ROD. Concurrence by the parties is indicated by the signatures in Section 1.2 of this ROD.

1.1.1 Soil OU Sites Selected for No Further Action

Cleanup options were not developed for sites which were previously clean-closed or recommended for clean-closure by Sacramento County (i.e., USTs already removed) or for which no contaminants of concern (COCs) were identified. Based on the human health risk assessment, all the sites have cancer risks within or below the acceptable range of 1×10^{-4} to 1×10^{-6} and non-cancer risks less than a hazard index of 1.0 in their current state. Therefore, cleanup or further investigative activities is not warranted. These no further action sites include: Sites 9, 10, 14, 16, 21, 22, 24, 26, 27, 28, 31, 33, 38, 40, 41, 42, 43, 44, 45, 46, 48, 49, 51, 52, 53, 55, 58, 61, 63, 64, 66, A, C, E, F, G, H, and I.

**Table 1-1. Selected Remedial Alternatives for the Soil Operable Unit Sites
Selected for Remedial Action**

Selected Remedial Alternative	Description
7.3*	Filling in the depression at Site 7 to grade with on-base soils; in situ bioremediation and possibly soil vapor extraction (SVE) of the contaminated shallow and deep soils at Sites 7 and 11; installation of a landfill cover at Site 7 as appropriate, and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
13.3	Excavation and transportation of the contaminated ditch sediments and surface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
15.3	Excavation and transportation of the contaminated ditch sediments to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and surface water monitoring if contamination remains at the site that threatens surface water quality.
20.2	Excavation and transportation of the contaminated shallow subsurface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
37.2**	Excavation and transportation of the contaminated surface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment; in situ bioremediation and possibly SVE of the contaminated shallow and deep subsurface soils at Sites 37, 39, and 54; and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
56.3	Excavation and transportation of the contaminated surface soils and shallow subsurface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
57.3	SVE of the contaminated shallow and deep subsurface soils and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
59.2	Excavation and transportation of the contaminated shallow subsurface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
60.2	Excavation and transportation of the contaminated shallow subsurface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
62.3	Excavation and transportation of the contaminated surface soils and shallow subsurface soils to the ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the sites that threatens groundwater quality.

**Table 1-1. Selected Remedial Alternatives for the Soil Operable Unit
Sites Selected for Remedial Action (Continued)**

Selected Remedial Alternative	Description
65.3	Excavation and transportation of the contaminated surface soils to an approved off-base facility for disposal; excavation and transportation of the contaminated shallow subsurface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
69.2	Excavation and transportation of the contaminated sediments and surface soils for on-base disposal as appropriate and surface water monitoring as appropriate if contamination remains at the site that threatens surface water quality.

* This remedial alternative applies to Sites 7/11.

** This remedial alternative applies to Sites 37/39/54.

Table 1-2. Selected Remedial Alternatives for the Groundwater Operable Unit Plumes

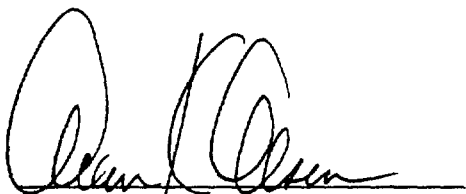
Selected Remedial Alternative	Description
Main/SAC.2	Extraction of the contaminated groundwater with treatment by air stripping and injection of the treated groundwater back into the aquifer (alternative means of groundwater discharge may be implemented) and groundwater monitoring. In addition, carbon will be utilized to adsorb and treat the off-gas from the air stripper, if appropriate.
SP7.2	Extraction of the contaminated groundwater with treatment by air stripping and injection of the treated groundwater back into the aquifer (alternative means of groundwater discharge may be implemented) and groundwater monitoring. In addition, carbon will be utilized to adsorb and treat the off-gas from the air stripper, if appropriate.
Selected Alternative	Long-Term Groundwater Monitoring and Land-Use Restrictions

1.1.2 Petroleum Only Sites Selected for No Further Action Under CERCLA (but remain to be closed under other regulations)

A "no action" decision is the selected remedy for the "petroleum only" sites based on the lack of statutory authority under CERCLA. The "petroleum only" sites include: Sites 19, 29/B, 32, 34, 35, and 36. Additionally, based on the human health risk assessment, all cancer risks are within or below the acceptable range of 1×10^{-4} to 1×10^{-6} and a non-cancer risk less than

a hazard index of 1.0 in their current state. However, these sites do not meet criteria for closure under RCRA Subtitle I and other applicable State of California regulations. Regulatory oversight will be provided by CVRWQCB and possibly Sacramento County.

1.2 Signatures



Alan K. Olsen

Director, Air Force Base Conversion Agency
U.S. Air Force

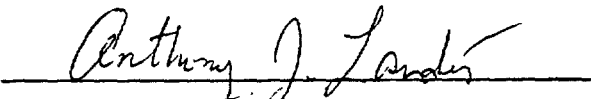
June 12, 1996
Date



Julie Anderson

Director, Federal Facilities Cleanup Office, Region IX
U.S. Environmental Protection Agency

6/21/96
Date



Anthony J. Landis, P.E.

Chief, Northern California Operations
Office of Military Facilities
Department of Toxic Substances Control
California Environmental Protection Agency

6.27.96
Date

2.0 Soil Operable Unit Sites Selected for Remedial Action

2.1 Declaration for the Soil Operable Unit Sites Selected for Remedial Action

Statutory Preference for Treatment as a
Principal Element is Met
and a Five-year Review is Required at those Soil OU
Sites Selected for Remedial Action Under CERCLA

2.1.1 Site Name and Location

Soil OU Sites (IRP Sites) Selected for Remedial Action
Mather AFB (a NPL Site)
Sacramento County, California

2.1.2 Statement of Basis and Purpose

The Soil OU sites were investigated under the Mather IRP and are described and evaluated in the RI/FS documents. This decision document presents the selected remedial actions for the Soil OU sites for which remedial action is warranted at the formerly active Mather AFB. These sites include: Sites 7/11 - "7100 Area" Disposal Site/Existing Fire Protection Training Area, Site 13 - Drainage Ditch Number 1, Site 15 - Drainage Ditch Number 3, Site 20 - Sewage Treatment Plant, Sites 37/39/54 - Building 3389/Hazardous Waste Control Storage Facility, Site 56 - OWS 2989, Site 57 - OWS 7019, Site 59 - OWS 4251, Site 60 - OWS 6900, Site 62 - Jet Engine Test Cell (Facility 7099) and OWS 7110, Site 65 - OWS 6910, and Site 69 - Open Burn/Open Detonation Area. These remedial actions were chosen in accordance with CERCLA, as amended by SARA, and to the extent practicable, the NCP. These decisions are based on the Administrative Record File for these sites.

The USEPA Region IX and the State of California concur with the selection of remedial alternatives for each of the Soil OU sites.

2.1.3 Assessment of the Sites

Contamination exists at these Soil OU sites as a result of past USAF operations conducted between 1918 and 1993.

Actual or threatened releases of hazardous substances from these sites, if not addressed by implementing the response actions selected in this section of the ROD, may present an imminent and substantial endangerment to human health, welfare, or the environment.

2.1.4 Description of the Selected Remedy

This section of the ROD addresses remedies related to contamination of the soils at Sites 7/11, 13, 15, 20, 37/39/54, 56, 57, 59, 60, 62, 65, and 69.

Based on the human health risk assessment, all cancer risks are within or below the acceptable range of 1×10^{-4} to 1×10^{-6} and all non-cancer risks have a hazard index of less than 1.0 in their current state, except for Sites 56, 62, and 69 which have an estimated current and future cancer risk greater than 1×10^{-4} . In addition, an ecological risk exists at Sites 13, 15, 20, 62, and 69. The selected remedies at the Soil OU sites will be instituted to reduce risk to human health, and/or reduce the risk to ecological receptors, and/or for the protection of groundwater/surface water quality.

Table 2-1 provides the major components of the selected remedy for each of the Soil OU sites.

Table 2-1. Remedial Alternatives for the Soil Operable Unit Sites Selected for Remedial Action

Selected Remedial Alternative	Description
7.3*	Filling the Site 7 depression to grade with on-base soils; in situ bioremediation and possibly soil vapor extraction (SVE) of the contaminated shallow and deep soils at Sites 7 and 11; installation of a landfill cover at Site 7 as appropriate, and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
13.3	Excavation and transportation of the contaminated ditch sediments and surface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
15.3	Excavation and transportation of the contaminated ditch sediments to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and surface water monitoring if contamination remains at the site that threatens surface water quality.
20.2**	Excavation and transportation of the contaminated shallow subsurface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site that threatens groundwater quality.

**Table 2-1. Remedial Alternatives for the Soil Operable Unit Sites Selected
for Remedial Action (Continued)**

Selected Remedial Alternative	Description
37.2***	Excavation and transportation of the contaminated surface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment; in situ bioremediation and possibly SVE of the contaminated shallow and deep subsurface soils at Sites 37, 39, and 54; and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
56.3	Excavation and transportation of the contaminated surface soils and shallow subsurface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site that threatens groundwater quality .
57.3	Soil vapor extraction of the contaminated shallow and deep subsurface soils and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
59.2	Excavation and transportation of the contaminated shallow subsurface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site , that threatens groundwater quality.
60.2	Excavation and transportation of the contaminated shallow subsurface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site , that threatens groundwater quality.
62.3	Excavation and transportation of the contaminated surface soils and shallow subsurface soils to the ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the sites that threatens groundwater quality.
65.3	Excavation and transportation of the contaminated surface soils to an approved off-base facility for disposal; excavation and transportation of the contaminated shallow subsurface soils to the on-base ex situ bioremediation facility for treatment and on-base disposal as appropriate after treatment and groundwater monitoring if contamination remains at the site that threatens groundwater quality.
69.2**	Excavation and transportation of the contaminated sediments and surface soils for on-base disposal as appropriate and surface water monitoring as appropriate if contamination remains at the site that threatens surface water quality.

* This remedial alternative applies to Sites 7/11.

** Soils do not overlay a contaminated groundwater plume , Main Base Groundwater Plume, Strategic Air Command Industrial Groundwater Plume, Site 7 Groundwater Plume, Northeast Groundwater Plume).

*** This remedial alternative applies to Sites 37/39/54.

2.1.5 Statutory Determinations

The selected remedies satisfy the statutory requirements of Section 121(b) of CERCLA, as amended by SARA, in that the following mandates are attained:

- the selected remedies are protective of human health and the environment;
- the selected remedies comply with federal and state requirements that are legally applicable or relevant and appropriate to the remedial actions;
- the selected remedies are cost-effective; and
- the selected remedies utilize permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable.

These remedies will result in hazardous substances remaining at some sites (i.e., Sites 56, 62, and 69) above levels that threaten human health or the environment during the remedial action. In addition, any of the remedial actions may result in contaminants remaining at the site above levels that allow for unlimited use. Therefore, a review will be conducted no less often than every five years after commencement of the selected remedial actions to ensure that the remedies continue to provide adequate protection of human health and the environment, and protect groundwater quality for its beneficial uses.

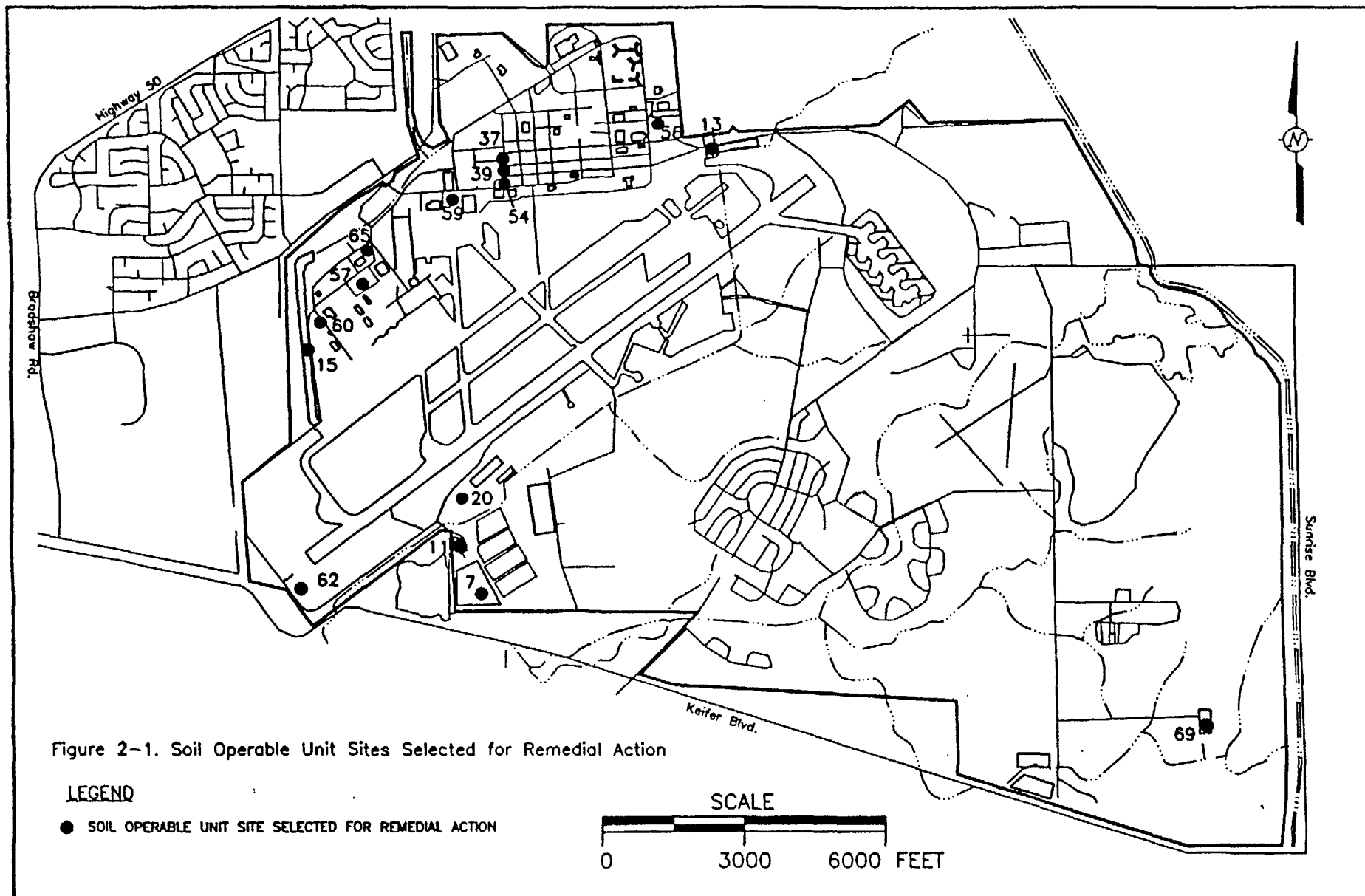
2.2 Decision Summary for Soil OU Sites Selected for Remedial Action

2.2.1 Site Names, Location, and Description

The Soil OU sites selected for remedial action at the formerly active Mather AFB are presented in Figure 2-1 and include: Site 7/11 - "7100 Area" Disposal Site/Existing Fire Protection Training Area, Site 13 - Drainage Ditch Number 1, Site 15 - Drainage Ditch Number 3, Site 20 - Sewage Treatment Plant, Site 37/39/54 - Building 3389/Hazardous Waste Central Storage Facility, Site 56 - OWS 2989, Site 57 - OWS 7019, Site 59 - OWS 4251, Site 60 - OWS 6900, Site 62 - Jet Engine Test Cell (Facility 7099) and OWS 7110, Site 65 - OWS 6910, and Site 69 - Open Burn/Open Detonation Area. More detailed site maps are presented in the Groundwater OU and Soil OU FFS Report [IT 1995a].

2.2.2 Site History and Enforcement Activities

Previous investigations have been conducted at the Soil OU sites selected for remedial action as part of the USAF IRP and are summarized in Table 2-2.



2.2.3 Highlights of Community Participation

The public participation requirement of CERCLA Sections 113(k)(2)(B)(I-v) and 117 were met through a public comment period (held May 8 through June 7, 1995) and public meeting (held May 18, 1995) to address the Proposed Plan and content of supporting RI/FS documents.

2.2.4 Scope and Role of Response Action

Environmental studies were initiated by the USAF in 1982 to investigate soil contamination resulting from past operations at the base. The USEPA placed Mather AFB on the NPL (or "Superfund" list) in 1989. In order to organize cleanup efforts, the base was divided into five OUs. This has allowed sites with similar sources of contamination and site conditions to be grouped together. The following section of this ROD discusses the cleanup options for one of the OUs, the Soil OU. Section 5.0 of this ROD presents cleanup options for the Groundwater OU. Previous RODs presented cleanup options for the AC&W OU [IT 1993e] (where contaminated groundwater is now being extracted and treated by air stripping) and the Landfill OU [IT 1994b]. Any sites not addressed in the ROD will be addressed in an upcoming Final Basewide OU ROD.

2.2.5 Summary of Site Characteristics

Contamination exists at the Soil OU sites as a result of past USAF operations conducted between 1918 and 1993. The Soil OU is comprised of contaminated soils associated with waste disposal pits, OWSs, gas stations, USTs, fire training areas, and other miscellaneous sites. Any impact to the groundwater underlying these sites is addressed in the Groundwater OU section of this ROD (Section 5.0).

Previous RIs have been conducted at Soil OU sites as part of the USAF IRP. A brief description of each of the Soil OU sites recommended for remedial action, including summaries of hazardous material releases and the nature and extent of contamination is provided in the following sections (contamination area and volume estimates for the sediments, surface soils, and subsurface soils are presented in Tables 2-3 through 2-5).

**Table 2-2. Previous Investigations at the Soil Operable Unit Sites Selected
for Remedial Action**

Site Number	Applicable Investigation
7/11	1, 2, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15
13	1, 3, 5, 7, 9, 10, 11, 13, 14, 15
15	1, 2, 4, 5, 7, 9, 10, 11, 13, 14, 15
20	1, 3, 5, 7, 9, 10, 14, 15
37/39/54	7, 11, 12, 13, 14, 15
56	5, 7, 11, 14, 15
57	7, 11, 14, 15
59	7, 11, 14, 15
60	11, 14, 15
62	11, 13, 14, 15
65	7, 11, 14, 15
69	7, 11, 13, 14, 15

1. Installation Restoration Program (IRP) Records Search for Mather Air Force Base, Phase I [CH2M-Hill, Inc. 1982];
2. IRP Phase II, Stage 1 Investigation [Weston 1986];
3. IRP Phase II, Stage 2 Investigation [AeroVironment 1987];
4. IRP Phase II, Stage 3 Investigation [AeroVironment 1988];
5. Well Redevelopment and Sampling Plan [IT 1988a];
6. Solid Waste Assessment Test Report [IT 1993b];
7. Quarterly Routine Groundwater Sampling [IT 1995c] and [EA 1990a-c];
8. Landfill Gas Testing Report [IT 1988b];
9. Site Inspection Report [IT 1990a];
10. Group 2 Sites Remedial Investigation Report [IT 1992a];
11. Group 3 Sites Technical Memorandum [IT 1993a];
12. Underground Storage Tank Closure Reports [IT 1990b and IT 1993c-d];
13. Soil Operable Unit (OU) and Groundwater OU Additional Field Investigation Report [IT 1994a];
14. Groundwater OU and Soil OU FFS Report [IT 1995a]; and
15. Mather Baseline Risk Assessment Report [IT 1995d].

Table 2-3. Estimated Areas and Volumes - Sediments

Site Number	Contaminant of Concern	Area (square feet)	Volume ^a (cubic feet)
13	4,7	2.4×10^4	4.8×10^4
15	2,4,5,6,7	5.8×10^4	1.2×10^5
69	1	1.1×10^3	2.2×10^3

a = two foot depth assumed for sediment contamination

Contaminant of Concern = 1-Dioxins and Furans, 2-Polycyclic aromatic hydrocarbons, 4-Metals, 5-Total petroleum hydrocarbons, 6-Polychlorinated biphenyls, and 7-Pesticides.

Table 2-4. Estimated Areas and Volumes - Surface Soils

Site Number	Contaminant of Concern	Area (square feet)	Volume ^a (cubic feet)
11	1	1.9×10^5	3.8×10^5
13	3,4,5	1.1×10^3	2.2×10^3
20	4	5.4×10^4	1.1×10^5
39	5	3.0×10^3	6.0×10^3
56	2,3,4,5	1.5×10^3	2.9×10^3
62	2,4,5	5.4×10^3	1.1×10^4
65	3,4,5	2.2×10^3	4.3×10^3
69	1	1.2×10^5	2.3×10^5

a = two foot depth assumed for calculating volumes

Contaminant of Concern = 1-Dioxins and Furans, 2-Polycyclic aromatic hydrocarbons, 3-Oil and grease, 4-Metals, and 5-Total petroleum hydrocarbons.

Table 2-5. Estimated Areas and Volumes - Subsurface Soils

Site Number	Contaminant of Concern	Area (square feet)	Volume (cubic feet)
7	TPH-D	1.9×10^5	2.9×10^6
	TPH-G	2.0×10^5	3.0×10^6
	Thallium	1.3×10^3	6.0×10^4
20	TPH-D	1.2×10^3	1.5×10^4
37	Benzene	(a)	(a)
	Oil and Grease	3.1×10^2	3.5×10^3
	TPH-D	3.1×10^2	3.5×10^3
	TPH-G	5.1×10^3	1.3×10^5
39	Benzene	6.0×10^4	1.5×10^6
	TPH-D	(b)	(b)
	TPH-G	4.1×10^4	1.7×10^6

Site Number	Contaminant of Concern	Area (square feet)	Volume (cubic feet)
54	Benzene TPH-G	(a) 8.0×10^2	(a) 2.0×10^4
56	Oil and Grease Lead TPH-D TPH-G	⊙ ⊙ 8.9×10^2 8.8×10^2	⊙ ⊙ 1.3×10^4 1.3×10^4
57	Trichloroethene	4.9×10^4	2.6×10^6
59	TPH-D TPH-G	6.7×10^2 1.6×10^3	1.4×10^4 3.2×10^4
60	TPH-G	6.6×10^2	9.9×10^3
62	TPH-D	2.3×10^2	2.5×10^3
65	TPH-D TPH-G	2.0×10^2 1.6×10^3	3.1×10^3 2.4×10^4

* Site 11 contains some contamination adjacent to Site 7 that will be remediated under the Site 7 alternative. The area and volume estimates will likely increase during remedial design.

(a) = included with the area, volume, and mass of Site 39

(b) = diesel detections are sporadic and coincide with higher concentration gasoline detections

⊙ = three detections above background, detections coincide with gasoline and diesel detections

TPH-D = Total petroleum hydrocarbons as diesel

TPH-G = Total petroleum hydrocarbons as gasoline

2.2.5.1 Site 7/11 - "7100 Area" Disposal Site/Existing Fire Protection Training Area

For purposes of remediation, Sites 7 and 11 were grouped together based on proximity and common contaminants.

Site 7 is located in the southwest corner of the base and has been used as a disposal area since 1953. The site was originally a gravel borrow pit excavated to a depth of approximately 40 feet. From 1953 until approximately 1966, this site was a major disposal area for petroleum, oil, and lubricant (POL) wastes. Other waste reportedly disposed of includes empty drums, sludge from plating-shop dip tanks, absorbent sand used for cleaning oil and solvent spills, paint chips, waste paint and thinners, and at least one load of transformer oil that may have contained polychlorinated biphenyls (PCBs).

Site 11 is located south of the Sewage Treatment Plant and adjacent to Site 7. Fire training exercises were conducted there from 1958 until 1993. Two jet propellant fuel (JP-4) aboveground storage tanks (ASTs) were installed in 1974; these have since been replaced. The facility was upgraded to include a lined burn pit in the mid-1980's.

Contamination at Site 7 has been identified in the shallow and deep subsurface soils. The COCs identified at the site are diesel, gasoline, lead, and thallium. Contamination at Site 11 has been identified in the surface soils. The COCs identified at Site 11 are dioxins and furans. These are not selected for remediation, but will be excavated as part of the Site 7 cleanup, and incorporated into the foundation for the cap at Site 7. This decision is based on dioxin detections below the cleanup standards set in response to regulatory comments on the risk assessment. Site 7 is the apparent historic source for groundwater contamination (see Section 5.2.5.2); although there have been no significant detections of chlorinated solvents in the Site 7/11 soils, soil gas will be monitored during remedial design per Section 2.2.9.1. The bases for cleanup are compliance with ARARs for waste disposal sites, mitigating a likely source of groundwater contamination, and protection of groundwater for its beneficial uses.

2.2.5.2 *Site 13 - Drainage Ditch Number 1*

Site 13 is located just north of the northeast end of runways, and is part of the surface drainage system for the base. Oil/water separator 3990 was installed at the site in 1968, and received runoff from two aircraft wash pads via area drains and piping. Prior to installation of OWS 3990, the waste may have been poured directly into the drainage ditch and/or a nearby shallow excavation.

Contamination at the site has been identified in the surface water, sediments, and surface soils. The COCs identified at the site are metals, pesticides, polycyclic aromatic hydrocarbons (PAHs), diesel, and oil and grease. The basis for cleanup is protection of ecological receptors and groundwater quality, and surface water quality.

2.2.5.3 *Site 15 - Drainage Ditch No. 3*

Site 15 covers the portion of the West Ditch that trends north-south along the western boundary of the base, 1,500 feet east of Happy Lane Boulevard and directly west of the former Strategic Air Command (SAC) portion of the base. The ditch is unlined and received surface runoff from the Main Base area, including the Air Training Command (ATC) and former SAC shops. Until about 1971, floor drains in the shops were connected to the storm sewer system which emptied into the West Ditch.

Oil/water separator 7039 is located at the southern end of the West Ditch and was installed in 1967. Waste oils and solvents were reportedly dumped directly into the separator system and occasionally overflowed into the West Ditch. Prior to construction of OWS 7039, waste oil was reportedly dumped into a below ground metal container or tank near the present location of the OWS.

Contamination at the site has been identified in the surface waters and sediments. The COCs identified at the site are metals, pesticides, PAHs, PCBs, gasoline, diesel, and oil and grease. The basis for cleanup is protection of ecological receptors and surface water quality.

2.2.5.4 Site 20 - Sewage Treatment Plant

Site 20 is located in the southwest portion of the base. This site contained a 150-gallon diesel UST that was excavated and removed in 1985. An estimated 700 gallons of diesel fuel leaked from the tank. Some sludge from the former waste water treatment at Site 20 remains on the site adjacent to the sludge drying beds, not associated with the diesel spill location. This sludge was planned for an expedited removal action in 1995, according to a Removal Action Memorandum dated September 1994. Recent sampling determined that the sludge contains hazardous waste and non-designated waste, and current plans are to dispose of any non-hazardous and non-designated sludge into Site 4 during landfill closure. This removal was delayed until 1996 because of budgetary constraints. Additional 'new' sludge was removed from digester tanks at Site 20 during demolition of these tanks in 1995. This 'new' sludge has remained isolated on site while it has been characterized for disposal; portions have been found to contain hazardous concentrations of mercury (as is reported in the Draft Additional Site Characterization Remedial Investigation Report, IT Corp., 1996). This sludge will be disposed of as hazardous waste, or stabilized as planned for lead-bearing sludge in the 1994 Removal Action Memorandum (IT, 1994c) to render it non-hazardous and non-designated for on-base disposal. In response to the detection of mercury in the 'new' sludge, a cleanup level for mercury at Site 20 has been added to this ROD, and will apply to all sludge and shallow soils.

The COCs identified at the sludge site are metals, while the only COC identified at the UST site is diesel. The bases for cleanup are protection of ecological receptors and groundwater quality.

2.2.5.5 Site 37/39/54 - Building 3389/Hazardous Waste Central Storage

For purposes of remediation, Sites 37, 39, and 54 were grouped together based on proximity and common contaminants.

Site 37 is located in the northwest portion of the base and is associated with five steel USTs at Building 3389. Four of the USTs had a capacity of 12,000 gallons and stored diesel fuel, lube

oil, and waste oil. The fifth UST had a capacity of 550 gallons and stored kerosene and solvents.

Site 39 operated from 1988 to 1993 as a hazardous waste storage facility permitted under the RCRA. Site 39 is a fenced compound located in the Main Base area consisting of a gravel-covered storage yard that contains several concrete pads and buildings. A variety of hazardous wastes were stored at this site. The site contained eight 25,000 gallon USTs used to store waste fuels and aviation gasoline, as well as one waste oil and one waste jet fuel AST. The USTs and ASTs were removed in 1993.

Site 54 is a RCRA facility and was a 90-day holding yard comprised of a large, fenced, asphalt-paved yard. The asphalt-paved yard is extensively cracked, and sealant applied to the cracks has eroded in many places. Browsers and drums of waste hydraulic fluids, PD-680 (a commercial variety of Stoddard solvent), and Citrikleen (a petroleum-based solvent that contains no chlorinated or aromatic solvents) were stored at the site at least since 1982.

Contamination at the combined sites has been identified in the surface soils, shallow subsurface soils, and deep subsurface soils. The COCs identified at the site are benzene, toluene, ethylbenzene, and xylenes (BTEX), diesel, gasoline, lead, and oil and grease. In addition, chlorinated solvents were detected at the combined Site 37/39/54 during the Additional Site Characterization (IT Corp., 1996). These contaminants will be evaluated in the feasibility study for the Final Operable Unit, and incorporated as appropriate in the remedial action for these sites as described in Section 2.2.9.5. The basis for cleanup is protection of groundwater quality.

2.2.5.6 *Site 56 - Oil/Water Separator 2989*

Site 56 consists of OWS 2989 located in the eastern portion of the Main Base and two former OWS facilities. Oil/water separator 2989 was used to receive wastewater generated at the Old Motor Pool washrack, which were treated and discharged to the sanitary sewer system. The following materials were reportedly contained in the wastewater: fuels, oil and grease, antifreeze, and possibly cleaning fluids.

Contamination has been identified in the surface soils and shallow subsurface soils. The COCs identified at the site are diesel, gasoline, metals, PAHs, and oil and grease. A current cancer

risk to humans (3.3×10^{-4}) and a potential future cancer risk to humans (8.0×10^{-4}) have been identified. The basis for cleanup is protection of human health and groundwater quality.

2.2.5.7 Site 57 - Oil/Water Separator 7019

Site 57 consists of OWS 7019 and is located in the central portion of the SAC area. This OWS was used to separate oils, fuels, hydraulic fluids, and PD-680 from the Aerospace Ground Equipment (AGE) Shop washwaters, and discharge the waters to the sanitary sewer system.

Contamination at the site has been identified in the shallow subsurface soils. The only COC identified at the site is trichloroethene (TCE). The basis for cleanup is protection of groundwater quality.

2.2.5.8 Site 59 - Oil/Water Separator 4251

Site 59 consists of OWS 4251 and is located in the southern portion of the Main Base at the ATC washrack, approximately ten feet south of Building 4252. Oil/water separator 4251 was constructed in 1969 and received wastewater generated from the ATC washrack. The wastewater reportedly contained fuels, oil and grease, hydraulic fluid, and antifreeze.

Contamination at the site has been identified in the shallow subsurface soils. The COCs identified at the site are diesel and gasoline. The basis for cleanup is protection of groundwater quality.

2.2.5.9 Site 60 - Oil/Water Separator 6900

Site 60 consists of OWS 6900 which is located in the SAC area and supported Building 7005. Building 7005 was an aircraft maintenance hanger used for aircraft fuel-system maintenance. A large floor (trench) drain within the hanger was used to collect fuel that emptied from an aircraft, which then emptied into underground vaults immediately outside the building. A conduit in the bottom of the vault led to the OWS. It is reported that TCE, perchloroethene (tetrachloroethene) (PCE), methyl ethyl ketone, and other solvents were used in Building 7005.

Contamination at the site has been identified in the shallow subsurface soils. The COCs at the site are gasoline and xylenes. The basis for cleanup is protection of groundwater quality.

2.2.5.10 Site 62 - OWS 7110 and Jet Engine Test Cell

Site 62 is located in the southwest portion of the base and consists of an abandoned Jet Engine Testing Cell (JETC) and adjoining OWS 7110, built in 1961. The JETC consisted of asphalt and concrete pads, Building 7098, a groundwater production well, and a water storage and treatment system. The site was used to test the operation of jet engines. Oils, fuels, and solvents may have been used at the site. Runoff from the JETC drained onto the surrounding soils. The OWS drained into a ditch running west near Building 7099.

Contamination at the site has been identified in the surface soils and shallow subsurface soils. The COCs identified at the site are diesel, metals, and PAHs. A future cancer risk to humans (1.5×10^{-4}) has been identified. The basis for cleanup is protection of human health, ecological receptors, and groundwater quality.

2.2.5.11 Site 65 Oil/Water Separator 6910

Site 65 consists of OWS 6910 and is located in the north section of the SAC area at the old AGE Shop, approximately 35 feet northeast of Building 7009. Oil/water separator 6910 was constructed in the mid-1960s and received wastewater containing fuels, oils, hydraulic fluids, and antifreeze generated from Building 7009. Effluent lines from OWS 6910 were reportedly connected to the sanitary sewer system in 1972.

Contamination at the site has been identified in the surface soils and shallow subsurface soils. The COCs identified at the site are chromium, diesel, gasoline, lead, and oil and grease. The basis for cleanup is protection of groundwater quality.

2.2.5.12 Site 69 - Open Burn Detonation Area

Site 69 is an excavated area in the southeastern portion of the base, reportedly used for destruction of unwanted small ordnance, classified aircraft parts, and other materials. At the south end is a burn pit approximately four feet deep and ten feet in diameter. The excavation is unpaved and unlined, and drains southwest to join an unnamed ephemeral tributary. At the northern end of the site are two small bunkers, a personnel bunker and a popping furnace, which were in use since the 1950s until 1993.

Contamination at the site has been identified in the surface water, sediments, and surface soils. The COCs identified at the site are metals and dioxins and furans. A potential future cancer risk to humans has been identified (1.1×10^{-4}). The basis for cleanup is protection of human health, ecological receptors, and surface water quality.

2.2.6 Summary of Site Risks

Remedial investigation activities at Mather AFB included fate and transport modeling and a baseline risk assessment (e.g., Mather Baseline Risk Assessment [MBRA]) [IT 1995d]. The data collected and utilized in the RIs and FFS were of USEPA quality Level III, IV, or V, or equivalent [USEPA 1987]. Formal data validation of the RI- and FFS-generated data was performed to ensure that data were of the quality commensurate with their intended use.

Although a majority of the Soil OU sites are currently controlled by the USAF, Mather AFB was decommissioned on September 30, 1993. Future land use is either residential or industrial, depending on the individual site. The following sections describe the criteria used to screen contaminants of potential concern (COPCs).

2.2.6.1 Human Health Risks

Analytes detected in the course of the RI activities (e.g., COPCs) at Mather AFB were subjected to a multi-step screening process to determine COCs. This screening process is presented in the following sections. The following steps were employed in the COC determination process for the Soil OU sites.

- initial screening methods prescribed by USEPA guidance;
- comparison to background;
- comparison to ARARs;
- comparison to analytical method quantitation limit;
- evaluation of operational history (i.e., process knowledge); and
- evaluation of estimated risk to human and ecological receptors.

2.2.6.1.1 Initial Screening

Remedial investigation data collected at the Soil OU sites were used to identify the initial COPCs. The list of initial COPCs was reduced using the following methods as prescribed by USEPA guidance [USEPA 1989a]:

- Quality Control Blank Contamination - As part of the data validation process, a chemical was not considered further if the maximum sample concentration did not exceed ten times the highest blank for all common laboratory contaminants (2-butanone, acetone, methylene chloride, phthalates, and toluene) or five times the highest blank for other chemicals. This screening action reduced the inclusion of chemicals that are most likely sampling or analytical artifacts.
- Frequency of Detection - Chemicals were eliminated if they were detected in five percent or less of the samples for a site. Infrequently detected chemicals may be artifacts of sampling, analytical, or other problems.
- Essential Nutrients - Calcium, carbonates, iron, magnesium, phosphorus, potassium, sodium, and sulfates are essential nutrients. These constituents are generally toxic only at very high doses and were eliminated because they were detected at levels below toxic concentrations.

All analytes which passed this initial screening, and associated chemical results were compiled on a site-specific basis to calculate the 95 percent upper confidence limit (UCL) on the mean concentration for each chemical. The 95 percent UCL for each COPC was used during subsequent steps in the COC determination process. The results of the initial screening and compilation are presented in the Group 2 Sites RI [IT 1992a] and the MBRA [IT 1995d].

2.2.6.1.2 Comparison to Background

A comparison of COPC concentrations to Mather AFB background concentrations was performed to determine if detections in environmental samples were due to naturally occurring constituents. This comparison utilized data from the "Background Inorganic Soils for Mather Air Force Base" report [IT 1993f].

2.2.6.1.2.1 Surface Water

For inorganics (only), deionized (D.I.) water waste extraction tests (WET) were performed on background surface soil/sediment samples. The associated results indicated the concentrations of metals which may be present in surface waters as a result of leaching from background

surface soils/sediments. Accordingly, the D.I. WET results are indicative of naturally occurring (background) concentrations of metals in surface waters in the area of Mather AFB.

Inorganic COPC concentrations in surface water were compared to the background soil D.I. WET results; COPCs for which maximum concentrations were less than associated D.I. WET results were eliminated from further consideration. Inorganics for which D.I. WET data were not available, and for all organics, background concentrations in surface water were assumed to be zero.

2.2.6.1.2.2 Soils and Sediments

For inorganics and oil and grease, the associated 95 percent UCLs for each COPC were compared to documented background levels [IT 1993g].

The COPCs for which the 95 percent UCL were within background concentrations/ranges, were eliminated from further consideration. For inorganics for which background data were not available, and for all organics with the exception of oil and grease, background concentrations were assumed to be zero.

The results of this comparison are presented in the MBRA [IT 1995d] and are reiterated in the FFS Report [IT 1995a].

2.2.6.1.3 Comparison to Analytical Method Quantitation Limit

For solid media, the calculated 95 percent UCLs were compared to the quantitation limit for each corresponding analytical method. In some cases, the 95 percent UCL was less than the quantitation limit as follows.

The initial data compilation was performed in accordance with USEPA risk assessment guidance [USEPA 1989a]. Such guidance mandates the inclusion of data qualified as not detected (i.e., ND) to be included in the database at a value of one-half the quantitation limit. Although such an approach is compatible with the conservative nature of risk assessment, associated results are frequently of limited value in an engineering context. Accordingly, if the 95 percent UCL was less than the quantitation limit the associated COPC was considered "not detected."

2.2.6.1.4 Comparison to Applicable or Relevant and Appropriate Requirements/To-Be-Considered

Chemical-specific ARARs were identified for surface water and soils and are further described in Section 6.0. There were no chemical-specific ARARs identified for air; however, the action-specific ARARs will control the release of pollutants to the air from the soils during remediation activities. Federal and state water regulation primary maximum contaminant levels (MCLs) were used for comparison to surface water and groundwater.

2.2.6.1.4.1 Surface Water

Contaminant of potential concern concentrations in surface waters were compared to appropriate to-be-considered materials (TBC), in most cases USEPA Ambient Water Quality Criteria (AWQC). The COCs for which the 95 percent UCL was less than the corresponding TBC were eliminated from further consideration.

2.2.6.1.4.2 Soils

Contaminant of potential concern concentrations in sediments and soils were compared to total designated levels (TDLs) calculated using the Designated Level Methodology (DLM) [CVRWQCB 1989].

The DLM was used to evaluate or estimate potential impact to the groundwater from COPCs in the surface and subsurface soils. The DLM was also used to screen COPCs in sediments to evaluate potential impacts to surface water. The application of this methodology consisted of the following steps:

- Determine the desired water quality goal (WQG) for each constituent - Promulgated regulations and standards were used where available. Contaminants in the surface soils and subsurface soils have a potential to impact groundwater (i.e., source of drinking water); therefore, the MCL was used as the WQG. Contaminants in the sediments could possibly impact surface waters; therefore, AWQC were used as the WQG. In the absence of promulgated regulations, contaminant goals, health advisories, or risk-based values were used as WQGs.
- Determine the Environmental Attenuation Factor for each constituent - This factor is used to transform WQGs into site-specific designated levels (concentrations of constituents in the wastes that have the potential to degrade water quality by migrating from the reference location).

- Determine a Leachability Factor - The leachability factor is the ratio of total to soluble concentrations of the chemical constituent. Where available, actual deionized solubilities determined using the California Waste Extraction Text protocol were used to assess the threat to water quality. Where measured solubilities were unavailable, a theoretical leachability factor was used. This factor was used to determine the fraction of the total constituent concentration available for leaching from the waste. The remaining portion of the constituent is immobile or unavailable for leaching due to encapsulation in the waste matrix or chemical bonding. A leachability factor of 100 was used for inorganic constituents and 10 for organic constituents as prescribed in the DLM guidance [CVRWQCB 1989], subject to agency review and professional judgement during document review.
- Determine a Total Designated Level - The TDL represents the concentration of a constituent in a solid waste which, if exceeded, may threaten the water

$$TDL = WQG \times EAF \times LF$$

quality. The TDL is calculated by the following equation:

where: TDL = total designated level
 WQG = water quality goal
 EAF = environmental attenuation factor
 LF = leachability factor

The COPCs for which the 95 percent UCL was less than the associated TDL were eliminated from further consideration, subject to reinstatement as COPCs if warranted by comment resolution or professional judgement during document review.

2.2.6.1.5 Process Knowledge Evaluation

Operational and disposal histories for the Soil OU sites were reviewed to evaluate the likelihood that past operations or disposal practices may have impacted the proximate environment. Results of the process knowledge evaluation were developed in accordance with the following definitions:

Yes:	documented, reported, or observed evidence (e.g., floating-product in an excavation) of a release for that COPC;
Possible:	evidence or documentation that the COPC was used or stored at the site;
No:	no evidence that the COPC was stored, used, and/or released at the site.

Process knowledge was not used as sole justification, but was used in conjunction with the other screening criteria, to aid in the elimination of constituents from the list of COPCs.

2.2.6.1.6 Risk Assessment Results

Estimates of potential risks/hazards to human and ecological receptors were obtained from the MBRA [IT 1995d]. Recent revisions include the use of surrogate toxicity values, an updated dermal exposure model, revised dermal absorption values, and an aggregate mining scenario [IT 1995b]. Additional ecological risk assessment activities were conducted in Spring 1995. These activities included further evaluation of the potential toxicity of surface water, sediment, and surface soil contaminants at three local habitat types and respective reference sites through toxicity testing and residue analysis. The house mouse exposure pathway was also re-evaluated utilizing an assumption of an omnivorous mouse. The initial list of COPCs (presented in the FFS Report [IT 1995a]) which were identified on the basis of potential ecological risk/hazard have not changed appreciably due to these additional activities.

From an ecological perspective, COPCs for which concentrations exceeded background screening values or for which associated estimates of potential ecological hazard index exceeded 1.0 were also identified as COCs. An ecological risk exists at Sites 13, 15, 20, 62, and 69. Therefore, the selected remedies at these sites will be instituted for the protection of ecological receptors and/or surface water quality.

From a human health perspective, COPCs for which the estimated incremental lifetime cancer risk exceeded 1×10^{-6} , or the hazard quotient exceeded 1.0, on an individual pathway basis, were identified as COCs.

Based on the human health risk assessment, all cancer risks were within or below the acceptable range of 1×10^{-4} to 1×10^{-6} in their current state, except for Sites 56, 62, and 69 which have a current and future cancer risk greater than 1×10^{-4} . Therefore, the selected remedies at Sites 56, 62, and 69 will be instituted to reduce human health risks and/or for protection of groundwater quality.

Actual or threatened releases of hazardous substances, if not addressed by implementing the response actions selected in the ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

2.2.7 Description of Alternatives

A total of 36 remedial alternatives (including the no action alternative) for the twelve Soil OU sites which warrant remedial action were developed for detailed analysis in the FFS Report [IT 1995a]. Soil is the affected medium at these sites. Any contamination of the groundwater underlying the soil sites is addressed in the Groundwater OU section of this ROD (Section 5.0).

In developing the alternatives, it was assumed that the sediments (maximum two foot deep), surface soils (zero to two feet below land surface [bls]), and shallow soils (2 to 30 feet bls) are capable of being excavated without specialized equipment. Deep soils (30 feet bls to the water table) are not considered feasible or appropriate to excavate. The no action alternative, as required by CERCLA, has been included for each site to provide a baseline.

2.2.7.1 Site 7/11 Remedial Alternative

Table 2-6 presents three remedial alternatives that have been developed for possible application at Site 7/11.

Table 2-6. Site 7/11 Remedial Alternatives

<i>ALTERNATIVE</i>	<i>DESCRIPTION</i>
7.1	No Action
7.2	Excavation (shallow soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); in situ bioremediation and possibly soil vapor extraction (SVE) (deep soils); capping (as appropriate); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site).
7.3	Filling in the depression at site 7 to grade; in situ bioremediation and possibly SVE (shallow and deep soils at sites 7 and 11); capping (as appropriate); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site).

2.2.7.2 Site 13 Remedial Alternatives

Table 2-7 presents three remedial alternatives that have been developed for possible application at Site 13.

Table 2-7. Site 13 Remedial Alternatives

ALTERNATIVE	DESCRIPTION
13.1	No Action
13.2	Excavation (sediments and surface soils) with off-base disposal and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)
13.3	Excavation (sediments and surface soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)

2.2.7.3 Site 15 Remedial Alternatives

Table 2-8 presents three alternatives that have been developed for possible application at Site 15.

Table 2-8. Site 15 Remedial Alternatives

ALTERNATIVE	DESCRIPTION
15.1	No Action
15.2	Excavation (sediments) with off-base disposal and surface water monitoring (if contamination that threatens surface water quality remains at the site)
15.3	Excavation (sediments) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); and surface water monitoring (if contamination that threatens surface water quality remains at the site)

2.2.7.4 Site 20 Remedial Alternatives

Table 2-9 presents three alternatives that have been developed for possible application at Site 20.

Table 2-9. Site 20 Remedial Alternatives

ALTERNATIVE	DESCRIPTION
20.1	No Action
20.2	Excavation (shallow soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)
20.3	In situ bioremediation (shallow soils) and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)

2.2.7.5 Site 37/39/54 Remedial Alternative

Table 2-10 presents three remedial alternatives that have been developed for possible application at Site 37/39/54.

Table 2-10. Site 37/39/54 Remedial Alternatives

<i>ALTERNATIVE</i>	<i>DESCRIPTION</i>
37.1	No Action
37.2	Excavation (surface soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); in situ bioremediation and possibly soil vapor extraction (SVE) (shallow and deep soils); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)
37.3	Excavation (surface and shallow soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); in situ bioremediation and possibly SVE, (deep soils); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)

2.2.7.6 Site 56 Remedial Alternatives

Table 2-11 presents three remedial alternatives that have been developed for possible application at Site 56.

Table 2-11. Site 56 Remedial Alternatives

<i>ALTERNATIVE</i>	<i>DESCRIPTION</i>
56.1	No Action
56.2	Excavation (surface soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); in situ bioremediation (shallow soils); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)
56.3	Excavation (surface and shallow soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)

2.2.7.7 Site 57 Remedial Alternatives

Table 2-12 presents three remedial alternatives that have been developed for possible application at Site 57.

Table 2-12. Site 57 Remedial Alternatives

ALTERNATIVE	DESCRIPTION
57.1	No Action
57.2	In situ bioremediation (shallow and deep soils) and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)
57.3	In situ soil vapor extraction (shallow and deep soils) and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)

2.2.7.8 Site 59 Remedial Alternatives

Table 2-13 presents three remedial alternatives that have been developed for possible application at Site 59.

Table 2-13. Site 59 Remedial Alternatives

ALTERNATIVE	DESCRIPTION
59.1	No Action
59.2	Excavation (shallow soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)
59.3	In situ bioremediation (shallow soils) and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)

2.2.7.9 Site 60 Remedial Alternatives

Table 2-14 presents four remedial alternatives that have been developed for possible application at Site 60.

Table 2-14. Site 60 Remedial Alternatives

<i>ALTERNATIVE</i>	<i>DESCRIPTION</i>
60.1	No Action
60.2	Excavation (shallow soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)
60.3	In situ soil vapor extraction (shallow soils) and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)
60.4	In situ bioremediation (shallow soils) and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)

2.2.7.10 Site 62 Remedial Alternatives

Table 2-15 presents three remedial alternatives that have been developed for possible application at Site 62.

Table 2-15. Site 62 Remedial Alternatives

<i>ALTERNATIVE</i>	<i>DESCRIPTION</i>
62.1	No Action
62.2	Excavation (surface soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); in situ bioremediation (shallow soils); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)
62.3	Excavation (surface and shallow soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)

2.2.7.11 Site 65 Remedial Alternatives

Table 2-16 presents three remedial alternatives that have been developed for possible application at Site 65.

Table 2-16. Site 65 Remedial Alternatives

ALTERNATIVE	DESCRIPTION
65.1	No Action
65.2	Excavation (surface soils) with off-base disposal; in situ bioremediation (shallow soils); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)
65.3	Excavation (surface soils) with off-base disposal; excavation (shallow soils) with ex situ bioremediation and on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-base disposal site(s)); and groundwater monitoring (if contamination that threatens groundwater quality remains at the site)

2.2.7.12 Site 69 Remedial Alternatives

Table 2-17 presents two remedial alternatives that have been developed for possible application at Site 69.

Table 2-17. Site 69 Remedial Alternatives

ALTERNATIVE	DESCRIPTION
69.1	No Action
69.2	Excavation (sediments and surface soils) with on-base disposal (or off-base disposal if the excavated material is classified as hazardous waste or would be classified as designated waste at the on-site disposal area), and surface water monitoring as appropriate if contamination remains on site that threatens surface water quality.

2.2.8 Summary of Comparison Analysis of Alternatives

The remedial alternatives developed in the FFS Report [IT 1995a] were analyzed in detail using the nine evaluation criteria required by the NCP (Section 300.430(e)(7)). These criteria are classified as threshold, primary balancing, and modifying criteria. In order for a remedial alternative to be selected, it must at a minimum, meet the threshold criteria.

Threshold criteria are:

- overall protection of human health and the environment; and
- compliance with ARARs.

Primary balancing criteria are:

- long-term effectiveness and permanence;
- reduction of toxicity, mobility, or volume through treatment;
- short-term effectiveness;
- implementability; and
- cost.

Modifying criteria are:

- state/support agency acceptance; and
- community acceptance.

The relative ability of each alternative to meet each of the nine criteria were weighed to identify the alternative providing the best tradeoffs for each site. The following sections summarize the nine criteria. Table 2-18 presents the results of the comparative analysis.

2.2.8.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether or not a cleanup option provides adequate protection. It also describes how risks, posed through each exposure route, are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2.2.8.2 Compliance with ARARs

Compliance with ARARs addresses whether a cleanup option will meet all ARARs or federal and state environmental statutes and/or provide grounds for invoking a waiver. Details of the ARARs analysis are described in Section 6.0 of this ROD.

2.2.8.3 *Long-Term Effectiveness and Permanence*

Long-term effectiveness and permanence refers to the ability of a cleanup option to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

2.2.8.4 *Reduction of Toxicity, Mobility, or Volume*

Reduction of toxicity, mobility, or volume refers to the anticipated ability of a cleanup option to reduce health hazards, contaminant migration, or quantity of contaminants at the site through treatment.

2.2.8.5 *Short-Term Effectiveness*

Short-term effectiveness refers to the period of time in which the remedy achieves protection, as well as the remedy's potential to prevent adverse impacts on human health and the environment that may result during the excavation, construction, or implementation period until the cleanup goals are achieved.

2.2.8.6 *Implementability*

Implementability refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to carry out a particular remedy. It also includes coordination of federal, state, and local governments in cleanup of the site.

2.2.8.7 *Cost*

This criterion examines the estimated cost for each remedial alternative. For comparison, capital and annual operation and maintenance costs were used to calculate a present worth cost for each alternative. The present worth cost estimates assume zero equipment salvage value, zero percent inflation, and a five percent discount factor so that each option could be equally compared in 1994 dollars. A detailed cost analysis was performed for each of the alternatives proposed in the FFS Report [IT 1995a].

2.2.8.8 *State/Support Agency Acceptance*

This indicates whether, based on review of the RI Report [IT 1992a], FFS Report [IT 1995a], and Proposed Plan [IT 1995b], the state concurs with the preferred cleanup options. The State of California is represented by the California Environmental Protection Agency, DTSC as a support agency under the Federal Facility Agreement for Mather AFB; DTSC coordinates review comments from other state agencies, such as the Central Valley Regional Water Quality Control Board (CVRWQCB) and the Integrated Waste Management Board.

Table 2-18. Comparative Analysis of Soil Operable Unit Remedial Alternatives

Evaluation Criteria	Site Number	7/11			13			15			20			37/39/54			56		
	Alternative	7.1	7.2	7.3'	13.1	13.2	13.3'	15.1	15.2	15.3'	20.1	20.2'	20.3	37.1	37.2'	37.3	56.1	56.2	56.3'
Overall Protection of Human Health and the Environment		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Compliance with ARARs		NA**	Yes	Yes	NA**	Yes	Yes	NA**	Yes	Yes	NA**	Yes	Yes	NA**	Yes	Yes	NA**	Yes	Yes
Long-Term Effectiveness and Permanence		G	B	B	G	B	B	F	B	B	F	B	B	F	B	B	G	B	B
Reduction of Toxicity, Mobility, and Volume		P	B	B	P	G	B	P	G	B	P	B	B	P	B	B	P	G	B
Short-Term Effectiveness		F	B	G	G	B	B	G	B	B	F	B	G	G	B	B	F	G	B
Implementability		G	G	B	B	G	G	B	G	G	B	G	B	B	G	G	B	G	G
Present Worth Cost (\$ millions)		0.018	4.21	3.69	0.15	0.88	0.279	0.51	2.20	0.827	0.28	0.33	0.62	0	1.75	3.38	0	0.71	0.048

* The State of California and the community concur on the selected remedial alternative asterisked for each of the Soil Operable Unit sites.

** ARARs do not have to be met unless a remedial action is taken.

P = Poor

F = Fair

G = Good

B = Best

NA = not applicable

ARAR = applicable or relevant and appropriate requirement

Table 2-18. Comparative Analysis of Soil Operable Unit Remedial Alternatives (continued)

Evaluation Criteria	Site Number	57			59			60				62			65			69	
	Alternative	57.1	57.2	57.3*	59.1	59.2*	59.3	60.1	60.2*	60.3	60.4	62.1	62.2	62.3*	65.1	65.2	65.3*	69.1	69.2*
Overall Protection of Human Health and the Environment		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Compliance with ARARs		NA**	Yes	Yes	NA**	Yes	Yes	NA**	Yes	Yes	Yes	NA**	Yes	Yes	NA**	Yes	Yes	NA**	Yes
Long-Term Effectiveness and Permanence		F	B	B	F	B	B	F	B	B	B	F	B	B	F	B	B	F	B
Reduction of Toxicity, Mobility, and Volume		P	G	B	P	B	B	P	B	B	B	P	B	B	P	B	B	P	B
Short-Term Effectiveness		G	B	B	F	B	G	P	B	G	F	F	G	B	G	B	B	G	B
Implementability		B	G	G	B	G	G	B	G	G	G	B	G	G	B	G	G	B	B
Present Worth Cost (\$ millions)		0	0.57	1.01	0	0.087	0.63	0.003	0.033	0.26	0.63	0.011	0.21	0.049	0.004	0.186	0.134	0.081	0.45

* The State of California and the community concur on the selected remedial alternative asterisked for each of the Soil Operable Unit sites.

** ARARs do not have to be met unless a remedial action is taken.

P = Poor

F = Fair

G = Good

B = Best

NA = not applicable

ARAR = applicable or relevant and appropriate requirement

2.2.8.9 Community Acceptance

This is an assessment of the general public response to the Proposed Plan following review of the public comments received on the RI Reports and FFS Report, during the public comment period (from May 8 through June 7, 1995) and open community meeting (held on May 18, 1995). Section 7.0 of this ROD documents the community acceptance of the selected remedies, as presented in the Responsiveness Summary.

2.2.9 The Selected Remedies

This section presents the remedies selected by the USAF, with concurrence by the USEPA and the State of California, for each of the Soil OU sites which warrant cleanup. The selected remedies were chosen based on the results of the comparative analysis of the alternatives presented in Table 2-18 and provide the best trade-offs with respect to the nine evaluation criteria. All design and construction of the selected remedial actions will be conducted by certified professionals or under the supervision of certified professionals, as appropriate.

2.2.9.1 Site 7/11 - "7100 Area" Disposal Site/Existing Fire Protection Training Area

Alternative 7.3 was selected by the USAF, with concurrence by the USEPA and the State of California, as the remedy for Site 7/11. The major components of this remedy include:

- filling in the depression at Site 7 with inert fill
- treating the contaminated shallow and deep soils at Sites 7 and 11 by in situ bioremediation and possibly soil vapor extraction (SVE). The in situ bioremediation system could be converted to a SVE system if significant amounts of solvents are encountered, in order to speed up remediation;
- installing a prescriptive landfill cover over the Site 7 impacted area if site conditions indicates it is appropriate, or a vegetative cover if there is no threat to groundwater quality nor generation of landfill gases, using inert soils and/or non-designated soils to construct the foundation for the cap/cover; and
- monitoring the groundwater (if contamination remains in place that threatens groundwater quality).

Remediation at Site 7/11 will be implemented in a phased approach, whereby SVE, bioventing, and soil gas monitoring will be implemented prior to a final determination on the need for a prescription landfill cover pursuant to Article 8 of 23 California Code of

Regulations (CCR), Division 3, Chapter 15. Once the SVE/bioventing system has been operated until it has met cleanup standards, or design goals as appropriate, or has otherwise reached technical or economic limitations, a determination will be made whether a continuing source of methane or trace gases exist, and whether a significant threat to groundwater quality exists.

The Air Force will conduct further soil gas sampling at this site to define the extent of VOC contamination, as part of the remedial design work. The feasibility of SVE will be evaluated when it is demonstrated that soil contaminants may cause concentrations in the leachate to exceed the aquifer cleanup levels, based on an interpretation of soil gas data using VLEACH or another appropriate vadose zone model.

The actual decision on whether to build and operate an SVE system will depend on the degree to which the contamination presents a threat to ground water and whether site characteristics are suitable for the SVE technology. It is generally preferable from a technical and cost perspective to clean up contamination in the vadose zone before it reaches the ground water. The feasibility analysis will be prepared by the Air Force as a primary document. The decision will be made by the signatory parties to the FFA and will be based, at a minimum, on the following factors:

- a. the cost and time associated with the predicted additional groundwater remediation if no SVE is implemented;
- b. the cost of implementing the SVE system to meet the SVE soil cleanup standard;
- c. the incremental cost over time of vadose zone remediation compared to the incremental cost of groundwater remediation, on the basis of a common unit (e.g., cost to remove a pound of TCE), provided that the underlying groundwater has not reached aquifer cleanup levels;
- d. the results of VLEACH or another appropriate vadose zone model, in conjunction with a groundwater fate and transport model to predict the resulting concentration from the vadose zone contamination in the nearest groundwater wells monitoring the site;
- e. the results of VLEACH or another appropriate vadose zone model, that interprets soil gas data, to predict the mass and concentration of discharges from the vadose zone to the groundwater;

This demonstration is to be made prior to operation of the bioventing system in areas considered for SVE (to prevent interference from bioventing). Once SVE is initiated, it will be terminated in accordance with the demonstration required for Site 57 (Section 2.2.9.7). The need to implement the bioventing remedy will be reevaluated when SVE is terminated.

Initial site grading will be accomplished in conjunction with drilling in order to allow site access for the drill rigs; the Site 7 depression may or may not be filled above grade at this time. Further grading may be accomplished to minimize infiltration of surface water into Site 7 during SVE and bioventing. Final site construction will be accomplished at the completion of SVE and bioventing consistent with the determination of the type of cap or cover that is required at Site 7.

Capital cost estimates for this remedy are projected at approximately \$2.7 million, operation and maintenance costs are estimated at \$2.0 million. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$3.69 million.

The basis for cleanup at Site 7/11 is compliance with ARARs for waste disposal sites, mitigating a likely source of groundwater contamination, and protection of groundwater quality for its beneficial use. Table 2-19 presents the Site 7/11 cleanup levels.

Table 2-19. Site 7/11 Cleanup Levels

Contaminant of Concern	Cleanup Level (ppm)
<i>Subsurface Soils</i>	
TPH as Diesel	10
TPH as Gasoline	1

TPH = total petroleum hydrocarbon

ppm = parts per million

2.2.9.2 Site 13 - Drainage Ditch Number 1

Alternative 13.3 was selected by the USAF, with concurrence by the USEPA and State of California as the remedy for Site 13. The major components of this remedy include:

- removing surface water, if present, by pumping and discharging to the publicly owned treatment works (POTW);
- excavating approximately 1,900 cubic yards (yd³) of contaminated sediments and surface soils to remove all contamination above acceptable levels;

- transporting the excavated soils to the on-base ex situ bioremediation facility;
- treating the excavated soils by ex situ bioremediation as appropriate;
- transporting the treated soils to, and consolidating them with landfill cap foundation materials at Site 7, as appropriate; and
- monitoring the groundwater if contamination that threatens groundwater quality remains at the site, and monitoring surface water if contamination that threatens surface water quality remains at the site.

Capital cost estimates for this remedy are projected at approximately \$100,000, operation and maintenance costs are estimated at \$212,000. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$279,000.

The basis for cleanup at Site 13 is protection of groundwater quality, surface water quality, and ecological receptors. Table 2-20 presents the Site 13 cleanup levels.

Table 2-20. Site 13 Cleanup Levels

Contaminant of Concern	Cleanup Level (ppm)
<i>Surface Water</i>	
Aluminum	6.28
Chromium	1.1×10^{-2}
Lead	9.4×10^{-3}
Manganese	1.0×10^{-1}
Silver	1.6×10^{-2}
Zinc	5.4×10^{-2}
<i>Sediment</i>	
Arsenic	16
Chromium	176
Chromium VI	ND (0.1)
Cobalt	35
Copper	104
Lead	81
Mercury	ND (0.2)

Table 2-20. Site 13 Cleanup Levels (Continued)

Contaminant of Concern	Cleanup Level (ppm)
Nickel	81
Vanadium	153
Zinc	116
4,4-DDD	1.9
4,4-DDE	1.3
4,4-DDT	1.3
<i>Sediment (Continued)</i>	
alpha-Chlordane	3.4×10^{-1}
Dieldrin	2.8×10^{-2}
gamma-Chlordane	3.4×10^{-1}
<i>Surface Soil</i>	
Arsenic	16
Benzo(a)anthracene	3.3×10^{-1}
Benzo(g,h,i)perylene	3.3×10^{-1}
Fluoranthene	3.3×10^{-1}
Indeno(1,2,3-cd)pyrene	3.3×10^{-1}
Mercury	ND (0.2)
Naphthalene	3.3×10^{-1}
Oil and Grease	430
Pyrene	3.3×10^{-1}
TPH as Diesel	100
Zinc	1559

ppm = parts per million

TPH = total petroleum hydrocarbon

DDT = dichlorodiphenyltrichloroethane

ND = not detected

DDD = dichlorodiphenyldichloroethane

DDE = dichlorodiphenyldichloroethene

2.2.9.3 Site 15 - Drainage Ditch Number 3

Alternative 15.3 was selected by the USAF, with concurrence by the USEPA and State of California as the remedy for Site 15. The major components of this remedy include:

- removing surface water, if present, by pumping and discharging to the POTW;
- excavating approximately 4,300 yd³ of contaminated sediments to remove all contamination above acceptable levels;
- transporting the sediments to the on-base ex situ bioremediation facility;
- treating the excavated sediments by ex situ bioremediation as appropriate;
- transporting the treated sediments to, and consolidating them with landfill cap foundation materials at Site 7, as appropriate; and
- monitoring the surface water if contamination that threatens surface water quality remains at the site.

Capital cost estimates for this remedy are projected at approximately \$229,000, operation and maintenance costs are estimated at \$682,000. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$827,000.

The basis for cleanup is protection of groundwater/surface water quality and ecological receptors. Table 2-21 presents the Site 15 cleanup levels.

Table 2-21. Site 15 Cleanup Levels

Contaminant of Concern	Cleanup Level (ppm)
<i>Surface Water</i>	
Chromium	1.1×10^{-2}
Lead	9.4×10^{-3}
Manganese	1.0×10^{-1}
Vanadium	1.0×10^{-1}
Zinc	5.4×10^{-2}
<i>Sediment</i>	
Barium	1300
Cadmium	1.4

Table 2-21. Site 15 Cleanup Levels (Continued)

Contaminant of Concern	Cleanup Level (ppm)
Sediment (Continued)	
Chromium	176
Chromium VI	ND (0.1)
Copper	104
Lead	81
Mercury	ND (0.2)
Zinc	116
Acenaphthene	3.3×10^{-1}
Acenaphthylene	3.3×10^{-1}
alpha-Chlordane	3.4×10^{-1}
Anthracene	3.3×10^{-1}
Aroclor 1248	6.6×10^{-2}
Aroclor 1254	6.6×10^{-2}
Aroclor 1260	6.6×10^{-2}
Benzo(a)anthracene	3.3×10^{-1}
Benzo(a)pyrene	3.3×10^{-1}
Benzo(b)fluoranthene	3.3×10^{-1}
Benzo(g,h,i)perylene	3.3×10^{-1}
Benzo(k)fluoranthene	3.3×10^{-1}
Chrysene	3.3×10^{-1}
Dibenzo(a,h)anthracene	3.3×10^{-1}
Dieldrin	2.8×10^{-2}
Fluoranthene	3.3×10^{-1}
Fluorene	3.3×10^{-1}
gamma-Chlordane	3.4×10^{-1}
Indeno(1,2,3-cd)pyrene	3.3×10^{-1}
Naphthalene	3.3×10^{-1}
Oil and Grease	430

Table 2-21. Site 15 Cleanup Levels (Continued)

Contaminant of Concern	Cleanup Level (ppm)
Sediment (Continued)	
Phenanthrene	3.3×10^{-1}
Pyrene	3.3×10^{-1}
TPH as Diesel	10
TPH as Gasoline	1

TPH = total petroleum hydrocarbon

ppm = parts per million

ND = not detected

2.2.9.4 Site 20 Sewage Treatment Plant

Alternative 20.2 was selected by the USAF, with concurrence by the USEPA and State of California as the remedy for Site 20. The major components of this remedy include:

- excavating approximately 550 yd³ of TPH-contaminated shallow soils to remove all contamination above acceptable levels;
- transporting the excavated soils to the on-base ex situ bioremediation facility;
- treating the excavated soils by ex situ bioremediation as appropriate;
- transporting the treated soils to, and consolidating them with landfill cap foundation materials at Site 7, as appropriate;
- removing sludge and disposing as appropriate in accordance with 1994 RAM for Site 20 (i.e. either disposal as hazardous waste, or treatment to render it non-hazardous and non-designated for on-base disposal); and
- monitoring the groundwater if contamination that threatens groundwater quality remains at the site.

Capital cost estimates for this remedy are projected at approximately \$31,700, operation and maintenance costs are estimated at \$338,000. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$325,000.

The basis for cleanup of TPH-d is protection of groundwater quality; the basis for cleanup of sludge is protection of human and ecological health. Table 2-22 presents the Site 20 cleanup levels.

Table 2-22. Site 20 Cleanup Levels

Contaminant of Concern	Cleanup Level (ppm)
<i>Surface Soil (sludge location)</i>	
Lead	130
Mercury	20
Zinc	1559
<i>Subsurface Soil (diesel spill location)</i>	
TPH as Diesel	10

TPH = total petroleum hydrocarbon

ppm = parts per million

2.2.9.5 Site 37/39/54 - Building 3389/Hazardous Waste Control Storage

Alternative 37.2 was selected by the USAF, with concurrence by the USEPA and the State of California as the remedy for Site 37/39/54. The major components of this remedy include:

- excavating approximately 220 yd³ of contaminated surface soils to remove all contamination above acceptable levels;
- transporting the excavated soils to the on-base ex situ bioremediation facility;
- treating the excavated soils by ex situ bioremediation as appropriate;
- transporting the treated soils to, and consolidating them with landfill cap foundation materials at Site 7, as appropriate;
- treating the contaminated shallow and deep soils by in situ bioremediation and possible SVE. The in situ bioremediation system could be converted if appropriate, to an SVE system if significant amounts of solvents are encountered in order to speed up remediation; and
- monitoring the groundwater if contamination that threatens groundwater quality remains at the site.

The Air Force will conduct further soil gas sampling at this site to define the extent of VOC contamination, as part of the remedial design work. The feasibility of SVE will be evaluated when it is demonstrated that soil contaminants may cause concentrations in the leachate to exceed the aquifer cleanup levels, based on an interpretation of soil gas data using VLEACH or another appropriate vadose zone model.

The actual decision on whether to build and operate an SVE system will depend on the degree to which the contamination presents a threat to ground water and whether site characteristics are suitable for the SVE technology. It is generally preferable from a technical and cost perspective to clean up contamination in the vadose zone before it reaches the ground water. The feasibility analysis will be prepared by the Air Force as a primary document. The decision will be made by the signatory parties to the FFA and will be based, at a minimum, on the following factors:

- a. the cost and time associated with the predicted additional groundwater remediation if no SVE is implemented;
- b. the cost of implementing the SVE system to meet the SVE soil cleanup standard;
- c. the incremental cost over time of vadose zone remediation compared to the incremental cost of groundwater remediation, on the basis of a common unit (e.g., cost to remove a pound of TCE), provided that the underlying groundwater has not reached aquifer cleanup levels;
- d. the results of VLEACH or another appropriate vadose zone model, in conjunction with a groundwater fate and transport model to predict the resulting concentration from the vadose zone contamination in the nearest groundwater wells monitoring the site;
- e. the results of VLEACH or another appropriate vadose zone model, that interprets soil gas data, to predict the mass and concentration of discharges from the vadose zone to the groundwater;

This demonstration is to be made prior to operation of the bioventing system in areas considered for SVE (to prevent interference from bioventing). Once SVE is initiated, it will be terminated in accordance with the demonstration required for Site 57 (Section 2.2.9.7). The need to implement the bioventing remedy will be reevaluated when SVE is terminated.

Capital cost estimates for this remedy are projected at approximately \$509,000 operation and maintenance costs are estimated at \$1,709,000. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$1,757,000.

The basis for cleanup is protection of groundwater quality. Table 2-23 presents the Site 37/39/54 cleanup levels.

Table 2-23. Sites 37/39/54 Cleanup Levels

Contaminant of Concern*	Cleanup Level (ppm)
SITE 37	
<i>Subsurface Soil</i>	
Oil and Grease	430
TPH as Diesel	10
TPH as Gasoline	1
SITE 39	
<i>Surface Soil</i>	
Oil and Grease	430
TPH as Diesel	100
<i>Subsurface Soil</i>	
Benzene	1×10^{-1}
Ethylbenzene	2.9
Toluene	4.2
TPH as Diesel	10
TPH as Gasoline	1
Xylene	1.7
SITE 54	
<i>Subsurface Soil</i>	
Benzene	1×10^{-1}
TPH as Gasoline	1

TPH = total petroleum hydrocarbon ppm = parts per million

* During the Additional Site Characterization field effort (IT Corp., 1996) chlorinated solvents were detected in the soil samples. However, these constituents and their corresponding cleanup goals are not presented in this Record of Decision. Any additional contaminants of concern and associated cleanup levels will be incorporated into the remedial design per Section 2.2.9.5 and documented in the Feasibility Study Report and Record of Decision for the Final Operable Unit.

2.2.9.6 Site 56 - Oil/Water Separator 2989

Alternative 56.3 was selected by the USAF, with concurrence by the USEPA and the State of California as the remedy for Site 56. The major components of this remedy include:

- excavating approximately 1,110 yd³ of contaminated surface and shallow soils to remove all contamination above acceptable levels;
- transporting the excavated soils to the on-base ex situ bioremediation facility;
- treating the excavated soils by ex situ bioremediation as appropriate;
- transporting the treated soils to, and consolidating them with landfill cap foundation materials at Site 4 or Site 7, as appropriate; and
- monitoring the groundwater if contamination that threatens groundwater quality remains at the site.

Capital cost estimates for this remedy are projected at approximately \$36,000, operation and maintenance costs are estimated at \$12,000. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$48,000.

The basis for cleanup is protection of human health and groundwater quality. Table 2-24 presents the Site 56 cleanup levels.

Table 2-24. Site 56 Cleanup Levels

Contaminant of Concern	Cleanup Level (ppm)
<i>Surface Soil</i>	
Arsenic	22
Benzo(a)anthracene	3.3×10^{-1}
Benzo(a)pyrene	3.3×10^{-1}
Benzo(b)fluoranthene	3.3×10^{-1}
Chrysene	3.3×10^{-1}
Dibenzo(a,h)anthracene	3.3×10^{-1}
Lead	130
Oil and Grease	430
TPH as Diesel	100

Contaminant of Concern	Cleanup Level (ppm)
<i>Subsurface Soil</i>	
Oil and Grease	430
TPH as Diesel	100
TPH as Gasoline	5

TPH = total petroleum hydrocarbon ppm = parts per million

2.2.9.7 Site 57 - Oil/Water Separator 7019

Alternative 57.3 was selected by the USAF, with concurrence by the USEPA and the State of California as the remedy for Site 57. The major components of this remedy include:

- treating the contaminated shallow and deep soils by in situ SVE; and
- monitoring the groundwater if contamination that threatens groundwater quality remains at the site.

The goal of cleaning up the vadose zone is to minimize further degradation of the groundwater by the contaminants in the soil. It is generally preferable from a technical and cost perspective to clean up contamination in the vadose zone before it reaches the groundwater. The soil cleanup standard will be achieved when the residual vadose zone contaminants will not cause the groundwater cleanup standard, as measured in groundwater wells monitoring the plume, to be exceeded after the cessation of the groundwater remediation. The Air Force will make the demonstration that the standard has been met through contaminant fate and transport modeling, trend analysis, mass balance, and/or other means. This demonstration will include examination of the effects of the residual vadose zone contamination in the groundwater using VLEACH or another appropriate vadose zone model, in conjunction with a groundwater fate and transport model, to predict the resulting concentration from this residual vadose zone contamination in the nearest groundwater wells monitoring the site. This demonstration can be made prior to the cessation of groundwater remediation. The Air Force shall provide verification, through actual data, that the above standard has been met. The signatory parties to this Record of Decision (ROD) will jointly make the decision that the soil cleanup standard has been met.

The Air Force shall operate the SVE system until it makes the demonstration that the cleanup standard, set forth above, has been met. The Air Force shall continue to operate the SVE system if appropriate, after considering the following factors:

- a) Whether the predicted concentration of the leachate from the vadose zone (using VLEACH or another appropriate vadose zone model that interprets soil gas data) will exceed the groundwater cleanup standard;
- b) Whether the mass removal rate is approaching asymptotic levels after temporary shutdown periods and appropriate optimization of the SVE system;
- c) The additional cost of continuing to operate the SVE system at concentrations approaching asymptotic mass levels;
- d) The predicted effectiveness and cost of further enhancements to the SVE system (e.g., additional vapor extraction wells);
- e) Whether the cost of groundwater remediation will be significantly more if the residual vadose zone contamination is not addressed;
- f) Whether residual mass in the vadose zone will significantly prolong the time to attain the ground water cleanup standard; and
- g) The incremental cost over time of vadose zone remediation compared to the incremental cost over time for groundwater remediation on the basis of a common unit (e.g., cost of pound of TCE removed) provided that the underlying groundwater has not reached aquifer cleanup levels.

The signatory parties agree that the Air Force may cycle the SVE system on and off in order to optimize the SVE operation and/or to evaluate the factors listed above.

The signatory parties to this ROD will jointly make the decision that the SVE system may be shut off. If the parties cannot reach a joint resolution, any party may invoke dispute resolution. This ROD does not resolve the ARAR status of State requirements regarding the establishment of soil cleanup levels. The parties agree that in the event of a dispute regarding SVE shutoff, the State may argue its authority to require soil cleanup (including soil cleanup standards) as the basis for continuing operation of the SVE system, based on the above factors.

Capital cost estimates for this remedy are projected at approximately \$852,000, operation and maintenance costs are estimated at \$168,000. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$1,012,000.

The basis for cleanup is protection of groundwater quality.

Table 2-25. Site 57 Cleanup Level

Contaminant of Concern	Cleanup Level
<i>Subsurface Soil</i>	
Trichloroethene	See text in Section 2.2.9.7

2.2.9.8 Site 59 - Oil/Water Separator 4251

Alternative 59.2 was selected by the USAF, with concurrence by the USEPA and the State of California as the remedy for Site 59. The major components of this remedy include:

- excavating approximately 1,200 yd³ of contaminated shallow soils to remove all contamination above acceptable levels;
- transporting the excavated soils to the on-base ex situ bioremediation facility;
- treating the excavated soils by ex situ bioremediation as appropriate;
- transporting the treated soils to, and consolidating them with landfill cap foundation materials at Site 4 or Site 7, as appropriate; and
- monitoring the groundwater if contamination that threatens groundwater quality remains at the site.

Capital cost estimates for this remedy are projected at approximately \$64,000, operation and maintenance costs are estimated at \$24,000. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$87,000.

The basis for cleanup is protection of groundwater quality. Table 2-26 presents the Site 59 cleanup levels.

Table 2-26. Site 59 Cleanup Levels

Contaminant of Concern	Cleanup Level (ppm)
<i>Subsurface Soil</i>	
TPH as Diesel	10
TPH as Gasoline	1

TPH = total petroleum hydrocarbon

ppm = parts per million

2.2.9.9 Site 60 - Oil/Water Separator 6900

Alternative 60.2 was selected by the USAF, with concurrence by the USEPA and the State of California as the remedy for Site 60. The major components of this remedy include:

- excavating approximately 350 yd³ of contaminated shallow soils to remove all contamination above acceptable levels;
- transporting the excavated soils to the on-base ex situ bioremediation facility;
- treating the excavated soils by ex situ bioremediation as appropriate;
- transporting the treated soils to, and consolidating them with landfill cap foundation materials at Site 4 or Site 7, as appropriate; and
- monitoring the groundwater if contamination that threatens groundwater quality remains at the site.

Capital cost estimates for this remedy are projected at approximately \$23,000, operation and maintenance costs are estimated at \$11,000. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$33,000.

The basis for cleanup is protection of groundwater quality. Table 2-27 presents the Site 60 cleanup levels.

Table 2-27. Site 60 Cleanup Levels

Contaminant of Concern	Cleanup Level (ppm)
<i>Subsurface Soil</i>	
TPH as Gasoline	5*
Xylenes	17

TPH = total petroleum hydrocarbon

ppm = parts per million

* If contamination is found to exist below the limits excavation, the remedial action and cleanup level will be reevaluated.

2.2.9.10 Site 62 - Oil/Water Separator 7110 and Jet Engine Test Cell (Facility 7099)

Alternative 62.3 was selected by the USAF, in concurrence by the USEPA and the State of California as the remedy for Site 62. The major components of the remedy include:

- excavating approximately 500 yd³ of contaminated surface and shallow soils to remove all contamination above acceptable levels;
- transporting the excavated soils to the on-base ex situ bioremediation facility;
- treating the excavated soils by ex situ bioremediation as appropriate;
- transporting the treated soils to, and consolidating them with landfill cap foundation materials at Site 4 or Site 7, as appropriate; and
- monitoring the groundwater if contamination that threatens groundwater quality remains at the site.

Capital cost estimates for this remedy are projected at approximately \$29,000, operation and maintenance costs are estimated at \$23,000. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$49,000.

The basis for cleanup is protection of ecological receptors, human health, and groundwater quality. Table 2-28 presents the Site 62 cleanup levels.

Table 2-28. Site 62 Cleanup Levels

Contaminant of Concern	Cleanup Level (ppm)
<i>Surface Soil</i>	
Benzo(k)fluoranthene	3.3×10^{-1}
Cadmium	9
Fluoranthene	3.3×10^{-1}
Lead	130
Naphthalene	3.3×10^{-1}
Pyrene	3.3×10^{-1}
TPH as Diesel	10
Zinc	1559

Table 2-28. Site 62 Cleanup Levels (Continued)

Contaminant of Concern	Cleanup Level (ppm)
<i>Subsurface Soil</i>	
Benzo(a)pyrene	3.3×10^{-1}
TPH as Diesel	10

TPH = total petroleum hydrocarbon

ppm = parts per million

2.2.9.11 Site 65 - Oil/Water Separator 6910

Alternative 65.3 was selected by the USAF, in concurrence by the USEPA and the State of California as the remedy for Site 65. The major components of the remedy include:

- excavating approximately 900 yd³ of contaminated surface and shallow soils to remove all contamination above acceptable levels;
- transporting the excavated surface soils to an off-base disposal facility;
- transporting the excavated shallow soils to the on-base ex situ bioremediation facility;
- treating the excavated shallow soils by ex situ bioremediation as appropriate;
- transporting the treated soils, and consolidating them with landfill cap foundation materials at Site 4 or Site 7, as appropriate; and
- monitoring the groundwater if contamination that threatens groundwater quality remains at the site.

Capital cost estimates for this remedy are projected at approximately \$114,000, operation and maintenance costs are estimated at \$22,000. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$134,000.

The basis for cleanup is protection of groundwater quality. Table 2-29 presents the Site 65 cleanup levels.

Table 2-29. Site 65 Cleanup Levels

Contaminant of Concern	Cleanup Level (ppm)
<i>Surface Soil</i>	
Chromium	210
Lead	130
Oil and Grease	430
TPH as Diesel	10
<i>Subsurface Soil</i>	
TPH as Diesel	10
TPH as Gasoline	1

TPH = total petroleum hydrocarbon ppm = parts per million

2.2.9.12 Site 69 - Open Burn/Open Detonation Area

Alternative 69.2 was selected by the USAF, in concurrence by the USEPA and the State of California as the remedy for Site 69. The major components of the remedy include:

- removing surface water, if present, by pumping and discharging to the POTW;
- excavating approximately 8,680 yd³ of contaminated sediments and surface soils to remove all contamination above acceptable levels;
- transporting the excavated sediments and surface soils to, and consolidating them with landfill cap foundation materials at Site 4, as appropriate; and
- monitoring surface water as appropriate if contamination remains at the site that threatens surface water quality.

Capital cost estimates for this remedy are projected at approximately \$370,000, operation and maintenance costs are estimated at \$93,000. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$451,000.

The basis for cleanup is protection of human health, ecological receptors, and surface water quality. Table 2-30 presents the Site 69 cleanup levels.

Table 2-30. Site 69 Cleanup Levels

Contaminant of Concern	Cleanup Level (ppm)
<i>Surface Water</i>	
Barium	1
Manganese	1.0 x 10 ⁻¹
<i>Sediment</i>	
OCDD	5 x 10 ⁻⁶ total 2,3,7,8-TCDD equivalent
OCDF	
Total HPCDD	
Total HPCDF	
Total HXCDD	
Total HXCDF	
Total PCDD	
Total PCDF	
Total TCDF	
<i>Surface Soil</i>	
Barium	1754
Manganese	(A)
Zinc	1559

Table 2-30. Site 69 Cleanup Levels (Continued)

Contaminant of Concern	Cleanup Level (ppm)
<i>Surface Soil (continued)</i>	
OCDD	2×10^{-4} total 2,3,7,8-TCDD equivalent
OCDF	
Total HPCDD	
Total HPCDF	
Total HXCDD	
Total HXCDF	
Total PCDD	
Total PCDF	
Total TCDF	

(A) Manganese was a contaminant of concern (COC) in the Focused Feasibility Study Report; however, revised natural background concentration is 5720 ppm. The maximum concentration detected was 1430 ppm; therefore, manganese is no longer a COC.

ppm = parts per million

HPCDF = heptachlorodibenzofuran

HXCDF = hexachlorodibenzofuran

OCDF = octachlorodibenzofuran

TCDF = tetrachlorodibenzofuran

PCDF = pentachlorodibenzofuran

HPCDD = heptachlorodibenzo-p-dioxin

HXCDD = hexachlorodibenzo-p-dioxin

OCDD = octachlorodibenzo-p-dioxin

TCDD = tetrachlorodibenzo-p-dioxin

PCDD = pentachlorodibenzo-p-dioxin

2.2.10 Statutory Determinations

The selected remedies satisfy the statutory requirements in CERCLA Section 121(b), as amended by SARA, in that the following mandates are attained:

- the selected remedies are protective of human health and the environment, will decrease site risks, and will not create short-term risks nor have cross-media consequences;
- the selected remedies comply with federal and state requirements that are applicable, or relevant and appropriate, to the remedial actions;
- the selected remedies are cost-effective in their fulfillment of the nine CERCLA evaluation criteria; and
- the selected remedies utilize permanent solutions to the maximum extent practicable.

3.0 Soil Operable Unit Sites Selected for No Further Action

3.1 Declaration for the Soil Operable Unit Sites Selected for No Further Action

No Further Action is Necessary to Ensure
Protection of Human Health and the Environment

3.1.1 Site Name and Location

Soil OU Sites (IRP Sites) Selected for No Further Action

Mather AFB (a NPL Site),

Sacramento County, California

3.1.2 Statement of Basis and Purpose

The Soil OU sites for which no further action was chosen at the formerly active Mather AFB were investigated under the Mather AFB IRP and are described and evaluated in the RI/FS documents. These sites include: Site 9 - Fire Department Training Area Number 2, Site 10 - Fire Department Training Area Number 3, Site 14 - Drainage Ditch Number 2, Site 16 - Electron Tube Burial Site, Site 21 - Asphalt Rubble Storage Site, Site 22 - Asphalt Rubble Storage Site, Site 24 - JP-4 Spill Site/Refueling Apron, Site 26 - Building 10072 UST, Site 27 - Building 10060 UST, Site 28 - Building 16100 UST, Site 31 - Building 10090 UST, Site 33 - Building 3308 USTs, Site 38 - Building 3388, Site 40 - Building 3875 UST, Site 41 - Building 2995 USTs, Site 42 - Building 2898 UST, Site 43 - Building 10150 USTs, Site 44 - Building 8540 UST, Site 45 - Building 7003 UST, Site 46 - Building 8158 UST, Site 48 - Building 10410 USTs, Site 49 - Building 10450 UST, Site 51 - Building 10030 UST, Site 52 - Building 10400 UST, Site 53 - Building 18501 UST, Site 55 - OWS 7038, Site 58 - OWS 4771, Site 61 - OWS 6905, Site 63 - OWS 3221 and USTs, Site 64 - OWS 4120, Site 66 - OWS 6915, Site A - Building 1226 UST, Site C - Building 3975 UST, Site E - Building 10015 UST, Site F - Building 10065 UST, Site G - Building 18018 UST, Site H - Building 18020 UST and Building 18011 UST, and Site I - Building 4853 UST. These remedial actions were chosen in accordance with CERCLA, as amended by SARA, and to the extent practicable, the NCP. These decisions are based on the Administrative Record for these sites.

The USEPA Region IX and the State of California concur that no action is necessary at these sites to ensure protection of human health and the environment.

3.1.3 Description of the No Further Action Decision

Cleanup options were not developed for sites which were previously clean-closed or recommended for clean-closure by Sacramento County (i.e., USTs already removed) or for which no COCs were identified. Based on the human health risk assessment, all cancer risks are within or below the acceptable range of 1×10^{-4} to 1×10^{-6} and all non-cancer risks have a hazard index of less than 1.0 in their current state. Therefore, the USAF is not proposing cleanup or further investigative activities. These no further action sites include: Sites 9, 10, 14, 16, 21, 22, 24, 26, 27, 28, 31, 33, 38, 40, 41, 42, 43, 44, 45, 46, 48, 49, 51, 52, 53, 55, 58, 61, 63, 64, 66, A, C, E, F, G, H, and I.

3.1.4 Summary of Site Risks

Remedial investigation activities at Mather AFB included fate and transport modeling and the MBRA [IT 1995d]. The data collected and utilized in the RIs and FFS were of USEPA quality Level III, IV, or V, or equivalent [USEPA 1987]. Formal data validation of the RI- and FFS-generated data was performed to ensure that data were of the quality commensurate with their intended use.

Based on the human health risk assessment, all cancer risks for the sites described in this no further action section are within or below the acceptable range of 1×10^{-4} to 1×10^{-6} , and all non-cancer risks have a hazard index less than 1.0 in their current state.

3.1.4.1 Human Health Risks

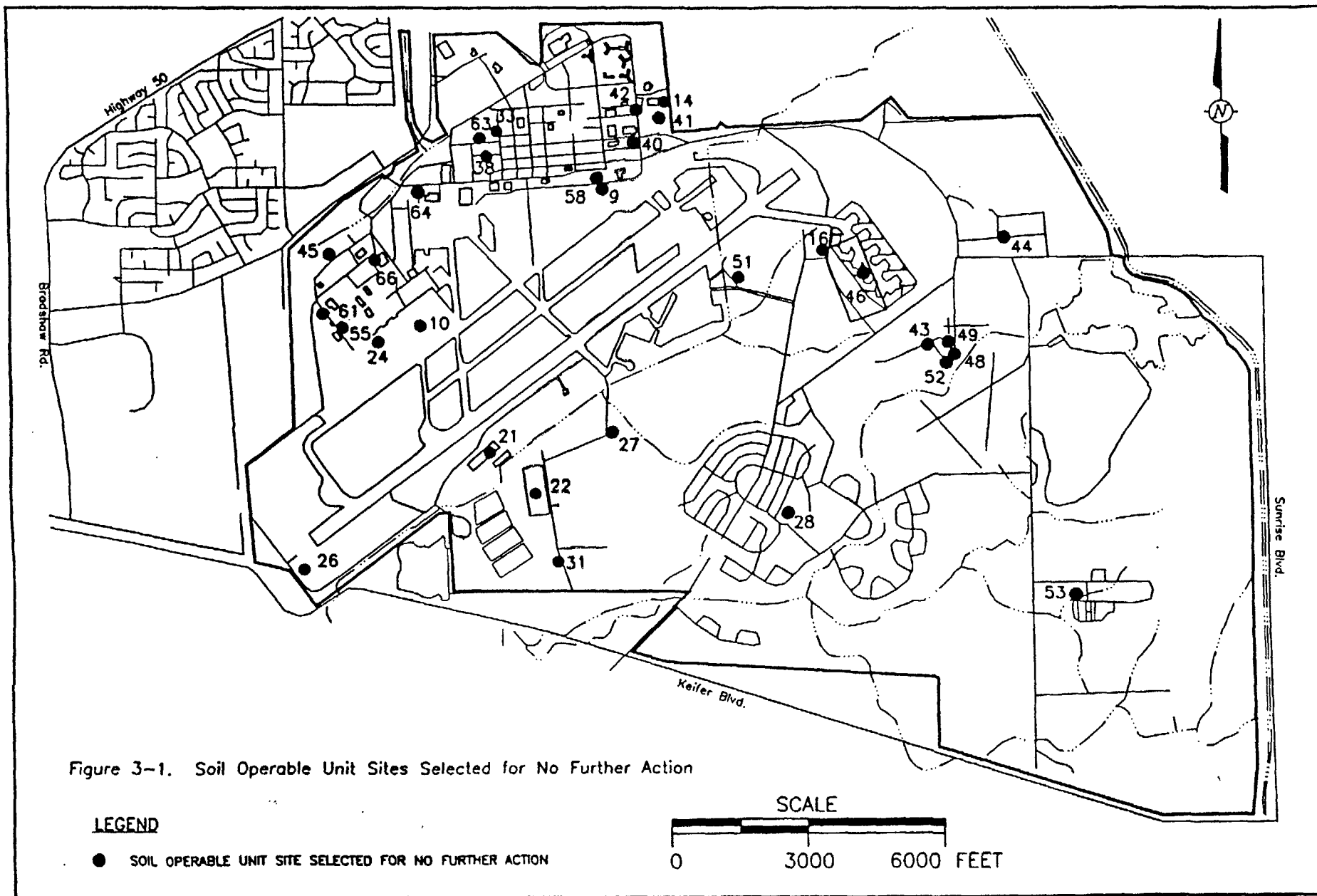
Analytes detected in the course of the RI activities at Mather AFB were subjected to a multi-step screening process to determine COCs. The following steps were employed in the COC determination process for the Soil OU sites and are described in Section 2.2.6.1.

- initial screening methods prescribed by USEPA guidance;
- comparison to background;
- comparison to ARARs;
- comparison to analytical method quantitation limit;
- evaluation of operational history (i.e., process knowledge); and
- evaluation of estimated risk to human and ecological receptors.

3.2 Decision Summary for Soil OU Sites Selected for No Further Action

3.2.1 Site Name, Location, and Description

The Soil OU sites selected for no further action at the formerly active base are presented in Figure 3-1 and in Section 3.1.2.



3.2.2 Site History and Enforcement Activities

Previous investigations have been conducted at the Soil OU sites selected for no further action as part of the USAF IRP and are presented in Table 3-1.

3.2.3 Highlights of Community Participation

The public participation requirement of CERCLA Sections 113(k)(2)(B)(I-v) and 117 were met through a public comment period (held May 8 through June 7, 1995) and a public meeting (held on May 18, 1995) to address the Proposed Plan and content of supporting RI/FS documents in the selection of the no further action sites.

3.2.4 Scope and Role of Response Action

Since these sites have been clean-closed or recommended to Sacramento County for clean-closure, or no COCs were identified, this section of the ROD presents the no further action alternative as the planned response action. No unacceptable risk to human health or the environment exists at these sites.

3.2.4.1 Description of the "No Action" Alternative

Cleanup options were not developed for sites which were previously clean-closed by Sacramento County or recommended for clean-closure (i.e., UST already removed to Sacramento County), or for which no COCs were identified. Since no risk to human health or the environment exists at these sites, the USAF is not proposing cleanup or further investigative activities. The no action alternative will not involve any long-term monitoring.

3.2.5 Summary of Site Characteristics

A brief description of each of the no further action sites is provided in the following sections.

3.2.5.1 Site 9 - Fire Department Training Area Number 2

Site 9 was used as a fire-training area between 1945 and 1947 and is reportedly located west of the Base Operations Building, underneath the aircraft parking ramp. Exercises were conducted daily in a cleared area within an earthen berm. Approximately 50 to 250 gallons of POL waste were reportedly used per exercise, with some solvents being possibly commingled with the POL waste. The location of Site 9 has not been found on historic air photographs, nor has any other evidence indicated where this site was situated. Consequently, no sampling has been conducted. Because the site cannot be located, no further action will be conducted under CERCLA.

Table 3-1. Previous Investigations at the No Further Action Sites

SITE NUMBER	APPLICABLE INVESTIGATION
9	1, 11, 12
10	1, 2, 4, 5, 6, 11, 12
14	1, 2, 3, 4, 5, 6, 7, 10, 11, 12
16	1, 4, 5, 7, 11, 12
21	1, 4, 11, 12
22	1, 11, 12
24	4, 5, 7, 11, 12
26	1, 4, 5, 6, 7, 9, 11, 12
27	1, 7, 11, 12
28	1, 7, 11, 12
31	9, 11, 12
33	9, 11, 12
38	9, 11, 12
40	9, 11, 12
41	9, 11, 12
42	9, 11, 12
43	9, 10, 11, 12
44	9, 11, 12
45	11, 12
46	9, 10, 11, 12
48	9, 10, 11, 12
49	9, 10, 11, 12
51	9, 10, 11, 12
52	9, 10, 11, 12
53	9, 10, 11, 12
55	5, 8, 11, 12
58	5, 8, 11, 12
61	8, 11, 12
63	5, 8, 9, 10, 11, 12
64	5, 8, 11, 12
66	5, 8, 11, 12
A	9, 10, 11, 12
C	7, 9, 10, 11, 12
E	9, 10, 11, 12
F	9, 10, 11, 12
G	9, 10, 11, 12
H	9, 10, 11, 12
I	9, 10, 11, 12

1. Installation Restoration Program (IRP) Records Search for Mather Air Force Base, Phase I [CH2M-Hill, Inc. 1982];
2. IRP Phase II, Stage 2 Investigation [AeroVironment 1987];
3. IRP Phase II, Stage 3 Investigation [AeroVironment 1988];
4. Well Redevelopment and Sampling Plan [IT 1988a];
5. Quarterly Routine Groundwater Sampling [IT 1993g] and [EA 1990a-c];
6. Site Inspection Report [IT 1990a];
7. Group 2 Sites Remedial Investigation Report [IT 1992a];
8. Group 3 Sites Technical Memorandum [IT 1993a];
9. Underground Storage Tank Closure Reports [IT 1990b and IT 1993c-d];
10. Soil Operable Unit (OU) and Groundwater OU Additional Field Investigation Report [IT 1994a];
11. Mather Baseline Risk Assessment Report [IT 1995d]; and
12. Groundwater OU and Soil OU Focused Feasibility Study Report [IT 1995a].

3.2.5.2 *Site 10 - Fire Department Training Area Number 3*

Site 10 is the assumed location of a fire-training area used between 1947 and 1958, and is located under the SAC refueling tanker loading apron. Approximately 100 to 500 gallons of POL waste, possibly commingled with solvents, were used per exercise. Investigations of this site have revealed no COCs. However, another location, just north of the former refueling apron, was found in 1994, and is now thought to be the actual location of the fire-training area. The new location, called Site 10C, was investigated in 1995 and will be included in the Final OU.

3.2.5.3 *Site 14 - Drainage Ditch Number 2*

Site 14 is an unlined drainage ditch located in the north-central portion of the base between Building 2950 and the former motor pool area. During the late 1960s, waste oils and solvents were reportedly dumped directly into the ditch. The ditch drains off-base and feeds a south-trending ditch that reenters the base at Site 13. Investigations have revealed no COCs.

3.2.5.4 *Site 16 - Electron Tube Burial Site*

Site 16 is located in the SAC area, directly under Building 8170. In the late 1950s, approximately sixty low-level radioactive electron tubes were reportedly buried in 15-foot auger holes. The electron tubes were placed inside one-gallon containers and encased in concrete. Investigations have revealed no radiation at the surface above background levels, nor in nearby groundwater from Well MAFB-18. There is no significant health risk due to exposure to the intact concrete containing the electron tubes. Future landowners or lessees will be notified that any excavation at the site should proceed with caution to avoid inadvertent exposure to broken concrete containers and/or electron tubes.

3.2.5.5 *Site 21 - Asphalt Rubble Storage Site*

Site 21 is located in two discrete areas northeast of Site 20. Asphalt and concrete rubble were stored on the ground in the two areas within the site. Site 21 did not reportedly receive any hazardous waste. Known disposal practices indicated no disposal of contaminants, and visual inspections were consistent with disposal of inert construction rubble only.

3.2.5.6 *Site 22 - Asphalt Rubble Storage Site*

Site 22 is located east of the sewage treatment plant. Asphalt and concrete rubble were stored on the ground at the site. Site 22 reportedly did not receive any hazardous waste. Known

disposal practices indicated no disposal of contaminants, and visual inspections were consistent with disposal of inert construction rubble only.

3.2.5.7 Site 24 - 1983 JP-4 Spill and Refueling Apron

Site 24 consists of the SAC aircraft refueling tanker loading apron and an adjacent low, grassy area located south and west of the loading area. In 1983, approximately 8,000 gallons of JP-4 were spilled on the concrete tanker loading area during refueling operations. Some of the fuel was reportedly washed by rainwater onto adjacent unpaved areas. Investigations have revealed no COCs.

3.2.5.8 Site 26 - Building 10072, One Abandoned UST

Site 26 is located in the extreme southwest corner of the base. The site had a 250-gallon UST which stored motor gasoline. The tank and its associated piping were installed in 1956 and removed in 1987. Investigations have revealed no COCs. This site has been recommended to Sacramento County for clean-closure.

3.2.5.9 Site 27 - Building 10060, One Abandoned UST

Site 27 is located in an ungraded, grassy area between the runways and the former base housing. A steel 379-gallon diesel fuel UST was installed at the site in 1954 and removed in 1987. Investigations have revealed no COCs. This site has been recommended to Sacramento County for clean-closure.

3.2.5.10 Site 28 - Building 16100, One Abandoned UST

Site 28 is located on the western edge of an open area between the former Wherry and Capehart housing, adjacent to base housing well FH-6. The site had a steel 218-gallon motor gasoline UST which was installed in 1968 and removed in 1987. Investigations have revealed no COCs. This site has been clean-closed by Sacramento County.

3.2.5.11 Site 31 - Building 10090, One Abandoned UST

Site 31 is approximately 2,000 feet east of Site 7. This site contained a 250-gallon steel UST that stored motor gasoline for emergency power generation. The tank was installed in 1954 and removed in December 1987. During excavation, a strong hydrocarbon odor was noted, and a "black scum" and "film of gasoline" were observed on the surface of water seeping into the excavation. Water was encountered 2 to 3 feet bls during excavation. The water encountered in the excavation was probably perched-water above a low permeability soil

horizon. The quantity of fuel lost at the site is unknown. This site has been recommended to Sacramento County for clean-closure. The Air Force intends to excavate limited soil at this site to remove easily removable contaminated soils.

3.2.5.12 Site 33 - Building 3308, Six Abandoned USTs

This site is located in the Main Base area, approximately 900 feet southwest of Site 32. This site contained one 3,600-gallon and five 1,500-gallon USTs that were used to store gasoline and mineral spirits. The tanks were installed in 1942. The tanks were reportedly taken out of service in 1961 and were removed in December 1988. During excavation, strong solvent odors were noted, and one of the tanks contained residual hydrocarbons.

Prior to completing the excavation, the hydrocarbons (approximately 540 gallons) were removed from the tank and transported to a recycling facility. Approximately 400 cubic yards of contaminated soil were removed from the site, incinerated, and disposed of on-base. The excavation was backfilled with clean crushed rock and then covered with four-inch thick asphalt paving. Potentially contaminated soil next to existing structures and buildings was not removed due to limited access; the Air Force will consider excavating additional soil under the building awning if consistent with building use or property transfer.

3.2.5.13 Site 38 - Building 3388

Site 38 consists of Building 3388 located near the intersection of Fourth Street and Air Corps Way. Two steel 5,000-gallon tanks (Tanks 3390 and 3391) were used to store gasoline, diesel, and alcohols from 1945 to 1977. This site has been recommended to Sacramento County for clean-closure.

3.2.5.14 Site 40 - Building 3875, One UST

Site 40 is at Building 3875 near the intersection of Stratotanker Avenue and Femoyer Street. A steel 570-gallon diesel fuel UST was installed in 1958 and removed in 1988. Investigations have revealed no COCs. This site has been clean-closed by Sacramento County.

3.2.5.15 Site 41 - Building 2995, Two USTs

Site 41 is at Building 2995 near Femoyer Street at the Old Motor Pool facility. This site had two, steel 10,500-gallon USTs which stored gasoline and diesel from 1965 to 1977. Investigations have revealed no COCs. The USTs were removed in 1989 and the site has been clean-closed by Sacramento County.

3.2.5.16 Site 42 - Building 2898, One UST

Site 42 is at Building 2898 located on Femoyer Street. This site had a steel 500-gallon UST which stored aviation gasoline from 1967 until 1974-1975. Investigations have revealed no COCs. The UST was removed in 1988 and the site has been clean-closed by Sacramento County.

3.2.5.17 Site 43 - Building 10150, Two Abandoned USTs

Site 43 is located in the east-central portion of the base near the AC&W site. One tank was removed in 1988 and the area clean-closed by Sacramento County. The second tank was removed in 1993 and the site recommended to Sacramento County for clean-closure. Investigations have revealed no COCs.

3.2.5.18 Site 44 - Building 8540, One UST

Site 44 consisted of a concrete 1,800-gallon UST located at Building 8540. The tank was used to store oil and water starting in 1942 and was removed in 1988. This site has been clean-closed by Sacramento County. Investigations have revealed no COCs.

3.2.5.19 Site 45 - Building 7003, One UST

Site 45 is at Building 7003 located at the old missile fueling facility. The tank was used to store ammonia from the early 1960s until 1978 and was removed in 1988. This site has been clean-closed by Sacramento County. Investigations have revealed no COCs.

3.2.5.20 Site 46 - Building 8158, One UST

Site 46 is at Building 8158 located in the northeast portion of the base, in the SAC Alert Facility and consisted of a steel 250-gallon diesel fuel UST. The UST and its associated piping were removed in 1993 and the site has been recommended to Sacramento County for clean-closure. Investigations have revealed no COCs.

3.2.5.21 Site 48 - Building 10410, Two Abandoned USTs

Site 48 is at Building 10410 located in the east-central portion of the base near the AC&W site. Site drawings indicate the presence of two USTs; however, a site inspection found only one tank. The existing tank which contained gear oil and diesel fuel was removed in 1993 and has been recommended to Sacramento County for clean-closure. Investigations have revealed no COCs.

3.2.5.22 Site 49 - Building 10450, One UST

Site 49 is located in the east-central portion of the base near the AC&W facility. The site consisted of a steel 8,500-gallon UST which contained gasoline and diesel. This tank was removed in 1993 and the site has been recommended to Sacramento County for clean-closure. Investigations have revealed no COCs.

3.2.5.23 Site 51 - Building 10030, One UST

Site 51 is located in the north-central portion of the base near the northeast end of Runway 22L. The site consisted of a 275-gallon diesel fuel UST. The UST was removed in 1993 and the site has been recommended to Sacramento County for clean-closure. Investigations have revealed no COCs.

3.2.5.24 Site 52 - Building 10400, One UST

Site 52 is located in the east-central portion of Building 10400. The site was covered by gravel, grass, and railroad-tie landscape border. The site consisted of a steel 4,000-gallon diesel fuel UST. The UST was removed in 1993 and the site has been recommended to Sacramento County for clean-closure. Investigations have revealed no COCs.

3.2.5.25 Site 53 - Building 18501, One UST

Site 53 is located in the southeast portion of the base, near Sites G and H and within the former Weapons Storage Facility area. The site consisted of a 200-gallon diesel fuel UST. The UST was removed in 1993 and the site has been recommended to Sacramento County for clean-closure. Investigations have revealed no COCs.

3.2.5.26 Site 55 - OWS 7038

Site 55 consisted of OWS 7038, located in the western portion of the SAC area, approximately 120 feet west of Building 7035. Oil/water separator 7038 is a belt-type skimmer which received aircraft washwater and discharges to the base sanitary sewer system. Prior to 1971, OWS 7038 reportedly received TCE, PCE, antifreeze, methyl ethyl ketone, and methylene chloride produced during maintenance operations. Investigations have revealed no COCs.

3.2.5.27 Site 58 - OWS 4771

Site 58 consists of OWS 4771 and is located in the southeast portion of the Main Base at the Army Helicopter washrack, approximately 450 feet east of Building 4677. Oil/water separator 4771 is a belt-type skimmer, constructed in 1969, that received wastewater generated from the

washrack. The wastewater reportedly contained fuels, oil and grease, hydraulic fluid, PD-680, and antifreeze. Effluent from the OWS was discharged directly to the sanitary sewer system. Investigations have revealed no COCs.

3.2.5.28 Site 61 - OWS 6905

Site 61 consists of an OWS that supports Building 7005, located in the SAC area. Building 7005 was an aircraft maintenance hangar (referred to as the Fuel Cell), used for aircraft fuel-system maintenance, which drained to OWS 6905. The OWS discharged directly to the storm sewer system. It was reported that TCE, PCE, methyl ethyl ketone, and other solvents were used in Building 7005 in the 1960s and 1970s. Investigations have revealed no COCs.

3.2.5.29 Site 63 - OWS 3321 and Two USTs

Site 63 is located in the northwest portion of the base and consisted of OWS 3321 at the South Hobby Shop, northeast of Building 3320. Oil/water separator 3321 is a sump-type OWS that received wastewater from the Automotive Hobby Shop and adjoining automotive component steam-cleaning pad at Building 3320. The wastewater may have contained fuels, oils, hydraulic fluid, antifreeze, cleaning fluids (containing trichloroethane, TCE, and methyl ethyl ketone), and paint strippers (containing phenols and methyl chloride). Underground storage tank 3320A was a 250-gallon waste oil tank, while UST 3320B was a 1,000 gallon waste oil tank. The tanks were removed in 1993 and the tank sites have been recommended to Sacramento County for clean-closure. Investigations have revealed no COCs.

3.2.5.30 Site 64 - OWS 4120

Site 64 consists of OWS 4120 and is located in the far west portion of the Main Base at the fuel tanker yard, approximately 240 feet northeast of Building 4120. Oil/water separator 4120 was a sump-type OWS that was constructed in the 1960s and received wastewater generated from the fuel truck washrack yard. These wastewater contained fuels, oils, hydraulic fluids, and antifreeze. Effluent from the OWS was discharged to the sanitary sewer system. Investigations have revealed no COCs.

3.2.5.31 Site 66 - OWS 6915

Site 66 consists of OWS 6915 and is located in the central portion of the SAC area at the jet engine repair shop, approximately 10 feet north of Building 7024. Oil/water separator 6915 is a sump-type OWS, constructed in the early 1960s, which received wastewater from the jet

engine repair shop. This wastewater contained fuels, oils, hydraulic fluid, and antifreeze. Effluent from this OWS was discharged directly to the storm drain system. Investigations have revealed no COCs. This site has been clean-closed by Sacramento County.

3.2.5.32 *Site A*

Building 1226 is the former Sierra Dining Hall located in the northwest portion of the base on Lower Placerville Road. Tank 1226 was located on the southeast side of the building and was reported to be a 4,000-gallon diesel fuel tank. Investigations have revealed no COCs. The tank was removed in 1993 and the site recommended to Sacramento County for clean-closure.

3.2.5.33 *Site C*

Building 3975 is located in the north-central portion of the base and is part of the Water Treatment Plant. Tank 3965 was reported to be a 550-gallon diesel fuel tank. The tank passed a leak test in 1988 and was removed in 1993. Investigations have revealed no COCs. The site has been recommended to Sacramento County for clean-closure.

3.2.5.34 *Site E*

Tank 10015 was located in the north-central portion of the base on Alert Road near the approach end of the Runway 22. It supported the Instrument Landing System Facility at Building 10015. The tank was reported to be a 1,000-gallon diesel fuel tank. The tank passed a leak test in 1988 and was removed in 1993. Investigations have revealed no COCs. The site has been recommended to Sacramento County for clean-closure.

3.2.5.35 *Site F*

Site F is located in the center of the base on Perimeter Road between Runway 22 and the air traffic control tower. The site consisted of Tank 10065, located west of Building 10065. The UST was a 1,000-gallon diesel fuel tank. Investigations have revealed no COCs. The UST was removed in 1993 and the site has been recommended to Sacramento County for clean-closure.

3.2.5.36 *Site G*

Site G is located in the southeast portion of the base near Sites H and 53. The site is south of Building 18018 and consists of a fiberglass 6,000-gallon diesel fuel tank. Investigations have revealed no COCs. The UST was removed in 1993 and the site has been recommended to Sacramento County for clean-closure.

3.2.5.37 *Site H*

Site H is located in the southeast portion of the base near Sites G and 53. It consisted of a steel 750-gallon diesel fuel tank located at the northeast corner of Building 18020.

Investigations have revealed no COCs. The UST was removed in 1993 and the site has been recommended to Sacramento County for clean-closure.

3.2.5.38 *Site I*

Site I consists of Tank 4853 and is located in the north-central portion of the base, approximately 60 feet east of the helicopter washrack. The steel 550-gallon UST reportedly stored unleaded gasoline. The UST passed a leak test in 1988 and was removed in 1993.

Investigations have revealed no COCs. The site has been recommended to Sacramento County for clean-closure.

4.0 Soil Operable Unit "Petroleum Only" Sites Selected for No Action Under CERCLA (but which remain to be closed under other regulations)

4.1 Declaration for the Soil Operable Unit Petroleum Only Sites Selected for No Action

No Action is Necessary Based
on the Lack of Statutory Authority under CERCLA

4.1.1 Site Name and Location

Soil OU "Petroleum Only" Sites Selected for No Action Under CERCLA (but which remain to be closed under other regulations)

Mather AFB (a NPL Site),
Sacramento County, California

4.1.2 Statement of Basis and Purpose

The "petroleum only" sites were investigated under the Mather AFB IRP and are described and evaluated in previous RI/FS documents. However, there is no CERCLA authority to take action at these sites. Therefore, they will be cleaned up under RCRA Subtitle I and other applicable State of California regulations with regulatory oversight by the CVRWQCB, and Sacramento County as appropriate. The IRP Soil OU "petroleum only" sites for which the no action remedial alternative was developed at the formerly active Mather AFB include: Site 19 - Fuel Tank Sludge Burial Site, Site 29/B - Fuel Spill at POL Yard Number 4, Site 32 - Fuel Spill at Army/Air Force Exchange Services Station, Site 34 - Fuel Spill at Family Housing Army/Air Force Exchange Services Station, Site 35 - Building 3326, and Site 36 - Building 3286. These sites consist of only petroleum contamination and have not been remediated, with the exception of Site 32 which was remediated in late 1995 through soil excavation and is expected to be closed by the Regional Water Quality Control Board. Section 3.0 of this ROD discusses sites which consist of only petroleum contamination. These sites have been clean-closed or recommend for clean-closure by Sacramento County. These decisions are based on the Administrative Record for these sites.

The USEPA Region IX and the State of California concur on the lack of statutory authority under CERCLA to examine remedial actions for the "petroleum only" sites; therefore, those

sites will be remediated under the Defense Environmental Restoration Program, RCRA Subtitle I and other applicable State of California regulations.

4.1.3 Description of the Selected Remedy

The COCs at the "petroleum only" sites are exempt from remedial action under CERCLA. Therefore, a "no action" decision is the selected remedy for the "petroleum only" sites based on the lack of statutory authority under CERCLA. The "petroleum only" sites include: Sites 19, 29/B, 32, 34, 35, and 36. Based on the human health risk assessment, all cancer risks are within or below the acceptable range of 1×10^{-4} to 1×10^{-6} and all non-cancer risks have a hazard index of less than 1.0 in their current state.

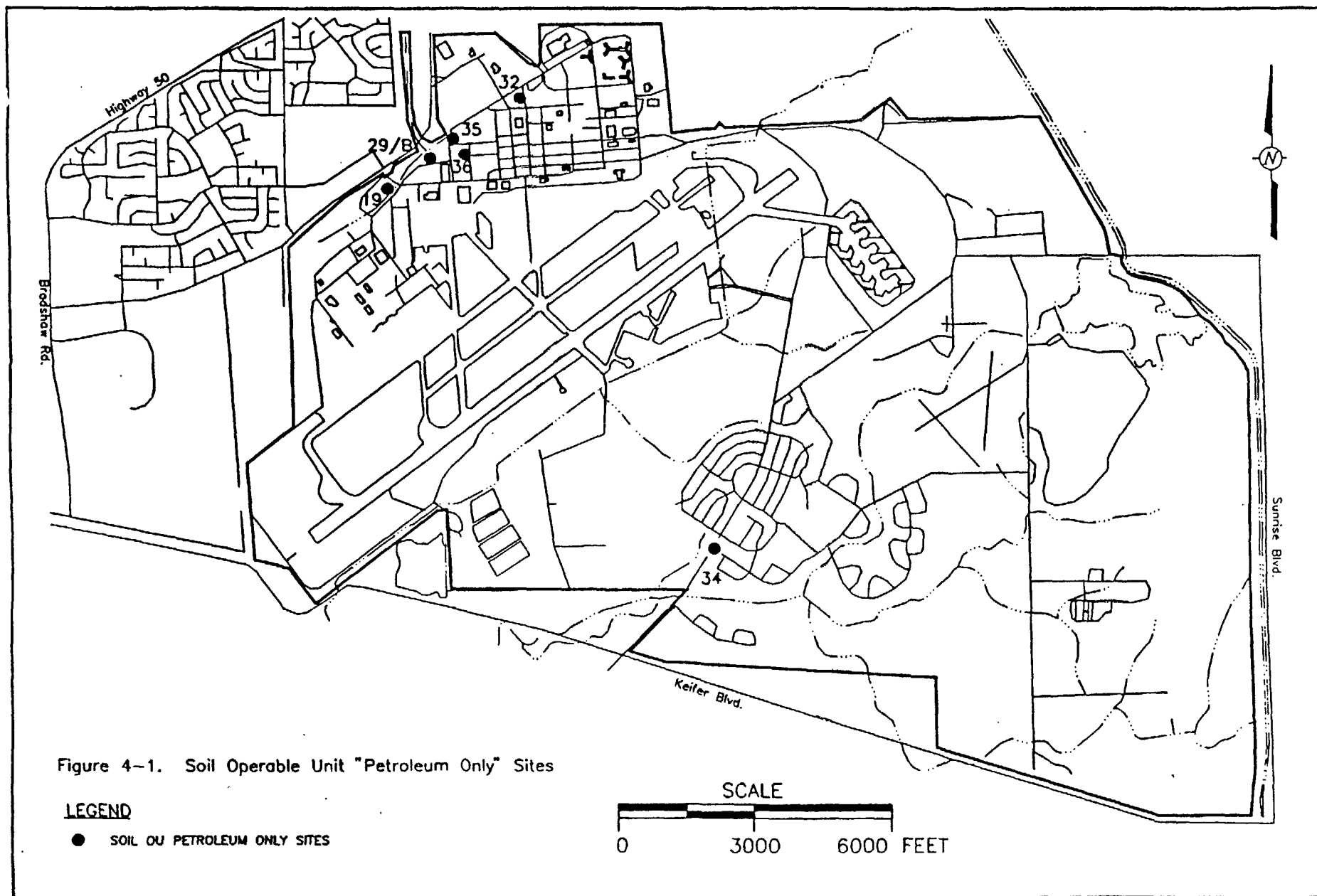
4.1.4 Declaration Statement

The USEPA does not have authority under CERCLA Section 104 to address the "petroleum only" sites. The "no action" decision does not constitute a finding that adequate protection has been achieved at the sites. Cleanup alternatives have been developed and documented in the FFS Report [IT 1995a] and these sites will be addressed under RCRA Subtitle I and other applicable State of California regulations, with regulatory oversight by the CVRWQCB, and Sacramento County as appropriate. Cleanup activities at the "petroleum only" sites are not subject to the same requirements as the CERCLA sites, i.e., "petroleum only" sites do not require a CERCLA five-year review, are not subject to the 15 month requirement to begin remedial activities, etc. However, permits will be required for remedial activities.

4.2 Decision Summary for Soil OU "Petroleum Only" Sites Selected for No Action Under CERCLA (but which remain to be closed under other regulations)

4.2.1 Site Name, Location, and Description

Locations of the Soil OU "petroleum only" sites at the formerly active Mather AFB are presented in Figure 4-1 and include: Site 19 - Fuel Tank Sludge Burial Site, Site 29/B - Fuel Spill at POL Yard Number 4, Site 32 - Fuel Spill at Army/Air Force Exchange Services Station, Site 34 - Fuel Spill at Family Housing Army/Air Force Exchange Services Station, Site 35 - Building 3326, and Site 36 - Building 3286.



4.2.2 Site History and Enforcement Activities

Cleanup options were developed for the "petroleum only" sites and are presented in the FFS Report [IT 1995a]; however, the USEPA does not have authority under CERCLA to address these sites. Therefore, the no action decision is documented as the selected remedy in this section of the ROD.

Previous investigations have been conducted at the Soil OU "petroleum only" sites as part of the USAF IRP and are summarized in Table 4-1.

Table 4-1. Previous Investigations at the Soil Operable Unit "Petroleum Only" Sites

SITE NUMBER	APPLICABLE INVESTIGATION
19	1, 2, 3, 4, 5, 6, 9, 10, 11
29/B	1, 6, 8, 9, 10, 11
32	1, 4, 6, 7, 10, 11
34	1, 8, 9, 10, 11
35	8, 9, 10, 11
36	8, 9, 10, 11

1. Installation Restoration Program (IRP) Records Search for Mather Air Force Base, Phase I [CH2M-Hill, Inc. 1982];
2. IRP Phase II, Stage 2 Investigation [AeroVironment 1987];
3. Well Redevelopment and Sampling Plan [IT 1988a];
4. Quarterly Routine Groundwater Sampling [IT 1995c] and [EA 1990a-c];
5. Site Inspection Report [IT 1990a];
6. Group 2 Sites Remedial Investigation Report [IT 1992a];
7. Group 3 Sites Technical Memorandum [IT 1993a];
8. Underground Storage Tank Closure Reports [IT 1990b and IT 1993c-d];
9. Soil Operable Unit (OU) and Groundwater OU Additional Field Investigation Report [IT 1994a];
10. Groundwater OU and Soil OU FFS Report [IT 1995a]; and
11. Mather Baseline Risk Assessment Report [IT 1995d].

4.2.3 Highlights of Community Participation

The public participation requirement of CERCLA Sections 113(k)(2)(B)(i-v) and 117 do not apply to these sites; however, these sites were included in the Proposed Plan, and the public comment period (held from May 8 through June 7, 1995) and public meeting (held May 18, 1995) to address the Proposed Plan and content of supporting RI/FS documents.

4.2.4 Scope and Role of Response Action

Since there is no CERCLA authority to take action at these sites, this section of the ROD presents the no action alternative to indicate that no action will occur at these sites under CERCLA authority as the planned response action.

4.2.5 Summary of Site Characteristics

The Soil OU is comprised of contaminated soils associated with OWSs, gas stations, and other miscellaneous sites. A summary of hazardous material releases is provided in the following section along with a summary of nature and extent of contamination on a site-by-site basis. The sources of contamination are fuels storage and delivery. The objective of this section of the ROD is to address the primary concerns at the Soil OU "petroleum only" sites posed by soil contamination.

Environmental studies were initiated by the USAF in 1982 to investigate soil contamination resulting from past base operations. The USEPA placed Mather AFB on the NPL (or "Superfund" list) in 1989. In order to organize cleanup efforts, the base is divided into five OUs. This has allowed sites with similar sources of contamination and site conditions to be grouped together. This section of the ROD discusses potential cleanup options for one of the OUs, the Soil OU. Previous RODs presented cleanup options for the AC&W OU [IT 1993e] (where groundwater contamination is now being extracted and treated by air stripping) and the Landfill OU, while the Groundwater OU is presented in Section 5.0 of this ROD. Any remaining sites will be addressed in the Final Basewide OU.

Previous RIs have been conducted at the Soil OU "petroleum only" sites as part of the USAF IRP. A brief description of the nature and extent of contamination at each of the Soil OU "petroleum only" sites is provided in the following sections and Table 4-2.

4.2.5.1 Site 19 - Fuel Tank Sludge Burial Site

Site 19 is located in the northwest portion of the base inside a diked area containing two JP-4 ASTs. It was reported that the site may have continued small quantities of weathered sludge from fuel tank cleaning operations. Contamination was identified in the shallow subsurface soils. The only COC at this site is gasoline. The COC is not related to the marked disposal site, but apparently is related to the operation of the ASTs, and associated USTs and piping.

Table 4-2. Estimated Areas and Volumes - Subsurface Soils

Site Number	Contaminant of Concern	Area (square feet)	Volume (cubic feet)
19	TPH-G	5.4×10^4	5.4×10^5
29/B	TPH-D	(a)	(a)
	TPH-G	1.4×10^5	6.3×10^6
	Benzene	8.0×10^4	4.1×10^6
32*	TPH-G	1.6×10^3	1.7×10^4
34	TPH-G	1.3×10^4	3.0×10^5
35	TPH-G	6.9×10^3	7.6×10^4
36	TPH-G	2.6×10^4	1.2×10^6

(a) = diesel detections are sporadic and coincide with higher concentration gasoline detections

TPH-D = Total petroleum hydrocarbons as diesel

TPH-G = Total petroleum hydrocarbons as gasoline

*Contaminated soil was excavated in late 1995. Site 32 is expected to be closed by the Regional Water Quality Control Board.

4.2.5.2 Site 29/B - Fuel Spill at Petroleum Oil and Lubricant Yard Number 4

Site 29 is situated near the western end of the Main Base and was used as a service station and POL yard from 1958 until 1988. The site consisted of four 25,000-gallon aviation gasoline USTs which were removed in 1984 and replaced with four fiberglass 20,000-gallon USTs which were removed in 1994. Site B is located adjacent to Site 29 and consisted of four 25,000-gallon USTs and one empty steel 550-gallon tank used for storing waste fuel. The USTs were removed in 1993. Contamination was identified in the shallow and deep subsurface soils. The COCs identified at the site are benzene, diesel, ethylbenzene, and xylenes. This site is currently being remediated by bioventing with SVE at "hot spots".

4.2.5.3 Site 32 - Fuel Spill at Army/Air Force Exchange Services Service Station

Site 32 is located in the north central portion of the base, in the Main Base administration and operations area. Between 1960 and 1973, a total of five, steel 10,000-gallon USTs were installed at this site. Three of the USTs and associated piping were removed in 1988. The two remaining USTs were removed in 1994. In addition, a 550-gallon waste oil tank was removed from the site in 1994. Contamination was identified in the shallow subsurface soils. The only COC identified at the site is gasoline. This site has been remediated through excavation of the soil in late 1995. It is expected that the site will be closed by the Regional Water Quality Control Board.

4.2.5.4 Site 34 - Fuel Spill at Family Housing Army/Air Force Exchange Services Service Station

Site 34 is located in the south central portion of the base, approximately 1,500 feet northeast of the south gate and adjacent to the former Family Housing Area. Building 21030 was constructed in 1968 and operated as an Army/Air Force Exchange Services Service Station until its closure in February 1988. Three, steel 10,000-gallon USTs located immediately northeast of Building 21030 were installed in 1968 to store unleaded premium, unleaded regular, and leaded regular gasoline. Additionally, two 250-gallon waste oil USTs are located at the southwest corner of the stations property. Contamination was identified in the shallow subsurface soils. The COCs identified at the site are benzene, gasoline, and xylenes.

4.2.5.5 Site 35 - Building 3226 - Four Abandoned USTs

Site 35 is located in the western portion of the Main Base and is the former location of four 25,000-gallon steel USTs. The USTs stored aviation gasoline from 1945 until approximately 1965. The USTs were removed in 1989. Contamination was identified in the deep subsurface soils. The only COC identified at the site is gasoline.

4.2.5.6 Site 36 - Building 3286

Site 36 is located in the western portion of the Main Base and is the former location of four 25,000-gallon steel USTs. The USTs stored motor gasoline from 1945 until approximately 1965. The USTs were removed in 1988. Contamination was identified in the shallow and deep subsurface soils. The only COC identified at the site is gasoline.

4.2.6 Summary of Site Risks

Remedial investigation activities at Mather AFB included fate and transport modeling and a MBRA [IT 1995d]. The data collected and utilized in the RIs and FFS were of USEPA quality Level III, IV, or V, or equivalent [USEPA 1987]. Formal data validation of the RI- and FFS-generated data was performed to ensure that data were of the quality commensurate with their intended use.

Based on the human health risk assessment, all cancer risks are within or below the acceptable range of 1×10^{-4} to 1×10^{-6} and all non-cancer risks have a hazard index of less than 1.0, respectively.

4.2.6.1 Human Health Risks

Analytes detected in the course of the RI activities at Mather AFB were subjected to a multi-step screening process to determine COCs. This screening process is presented in Section 2.2.6.1. The following steps were employed in the COC determination process for the Soil OU sites and are discussed in Section 2.2.6.1.

- initial screening methods prescribed by USEPA guidance;
- comparison to background;
- comparison to ARARs;
- comparison to analytical method quantitation limit;
- evaluation of operational history (i.e., process knowledge); and
- evaluation of estimated risk to human and ecological receptors.

4.2.7 Statutory Authority Finding

The no action finding is selected based on the petroleum exclusion in CERCLA.

5.0 Groundwater Operable Unit Plumes Selected for Remedial Action

5.1 Declaration for the Groundwater Operable Unit Plumes Selected for Remedial Action

Statutory Preference for Treatment as a
Principal Element is Met
and a Five-Year Review is Required for
the Main Base/SAC Industrial and Site 7 Groundwater Plumes

Statutory Preference for Treatment as a
Principal Element is Not Met
and a Five-Year Review is Required for
the Northeast Groundwater Plume

5.1.1 Plume Name and Location

Groundwater OU Plumes Selected for Remedial Action
Mather AFB (a NPL Site),
Sacramento County, California

5.1.2 Statement of Basis and Purpose

The Groundwater OU plumes were investigated under the Mather AFB IRP and are described and evaluated in the RI/FS documents. This decision document presents the selected remedial actions which were developed for the Groundwater OU plumes at the formerly active Mather AFB. These plumes include: the Main Base/SAC Industrial Area, the Site 7, and the Northeast. These remedial actions were chosen in accordance with CERCLA, as amended by SARA, and to the extent practicable, the NCP. These decisions are based on the Administrative Record for these plumes.

The USEPA Region IX and the State of California concur on the selected remedial alternatives for each of the Groundwater OU plumes.

5.1.3 Assessment of the Plume

Contamination exists at the Groundwater OU plumes as a result of past USAF operations conducted between 1918 and 1993. The Groundwater OU encompasses the contaminated groundwater beneath and within the immediate vicinity of the base with the exception of the

AC&W OU plume, which is addressed in a separate ROD (IT, 1993). The main sources of contamination include industrial activities, equipment maintenance, landfill disposal, other waste disposal activities (i.e., Site 7), and fuels storage and delivery.

Investigation of numerous IRP sites has identified several sources of groundwater contamination, most notably Site 57, where chlorinated solvents have been detected in soil and soil gas over a broad area. Site 18 may also be a source; an SVE pilot test was conducted as part of the Additional Site Characterization Remedial Investigation (ASC RI) in 1995 (IT Corp, 1996a). The location of 'hot spots' of contamination at the water table indicates the likelihood of nearby sources of contamination in the overlying soil or perhaps in the upgradient direction (i.e. the direction from which the contamination would be carried by the moving groundwater). Examples are near Site 37/39/54 and near Site 56. These sources must have existed in the past, and many probably still exist today, even though the use of the chemicals at Mather has been eliminated for years. Additional continuing sources of groundwater contamination were investigated in 1995 during the ASC RI (IT Corp., 1996b). Portions of the sanitary sewer system that overlies groundwater contamination at the water table were targeted for flushing, sampling and soil gas measurements.

Known vadose-zone sources are addressed as part of the Soil OU (this ROD) or will be addressed in the Final OU ROD. Additional characterization may be necessary to evaluate potentially significant sources of groundwater contamination. Any remedial actions for additional source areas will be addressed as part of a future decision document.

Actual or threatened releases of hazardous substances from these plumes, if not addressed by implementing the response actions selected in this section of the ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

5.1.4 Description of Selected Remedy

This section of the ROD addresses remedies related to contamination of the groundwater underlying the Main Base/SAC Industrial Area, the Site 7 Area, and the Northeast Area Landfill Sites. Any contamination of the soil overlying the groundwater plumes has been addressed in separate sections of this ROD (Sections 2.0 and 4.0).

Based on the human health risk assessment, all cancer risks are within or below the acceptable range of 1×10^{-4} to 1×10^{-6} and all non-cancer risks have a hazard index of less than 1.0, respectively, in their current state, except for the Main Base/SAC Industrial Area Groundwater

Plume which has a cancer risk greater than 1×10^{-4} associated with the highest concentration detected in the groundwater plume. Therefore, the selected remedies will be instituted to reduce risk to human health and the environment and to comply with the requirements that are ARARs based on the beneficial use of the groundwater and the specific conditions of the site.

Table 5-1 provides the major components of the selected remedy for each of the Groundwater OU plumes.

Table 5-1. Selected Remedial Alternatives for the Groundwater OU Plumes

Selected Remedial Alternative	Description
Main/SAC.2	Groundwater extraction, air stripping with off-gas treatment (carbon adsorption), and groundwater injection*; and groundwater monitoring
SP7.2	Groundwater extraction, air stripping with off-gas treatment (carbon adsorption), and groundwater injection*; and groundwater monitoring
NE.1	Long-term groundwater monitoring

*Alternative discharge options may be implemented for discharge of treated groundwater. Examples of alternate means of discharge are: injection into a deeper aquifer; recharge through the vadose zone; surface water discharge; provision of water to industrial/agricultural user(s); and provision of water for municipal supply.

SAC = Strategic Air Command

NE = Northeast

OU = operable unit

SP7 = Site 7

5.1.5 Statutory Determinations

The selected remedies satisfy the statutory requirements of Section 121(b) of CERCLA, as amended by SARA, in that the following four mandates are attained:

- the selected remedies are protective of human health and the environment;
- the selected remedies comply with federal and state requirements that are legally applicable or relevant and appropriate to the remedial actions;
- the selected remedies are cost-effective; and
- the selected remedies utilize permanent solutions and alternative treatment technologies, or resource recovery technologies, to the maximum extent practicable.

These remedies will result in hazardous substances remaining onsite at some of the groundwater plumes above health-based levels during the remedial action. Therefore, a review will be conducted within five years after commencement of the remedial actions to ensure that the

remedies continue to provide adequate protection of human health and the environment, and protect groundwater quality.

5.2 Decision Summary for Groundwater OU Plumes Selected for Remedial Action

5.2.1 Plume Name, Location, and Description

The Groundwater OU plumes selected for remedial action at the formerly active Mather AFB are presented in Figure 5-1 and include the: Main Base/SAC Industrial Area Groundwater Plume, the Site 7 Groundwater Plume, and the Northeast Groundwater Plume.

5.2.2 Site History and Enforcement Activities

Previous investigations have been conducted at the Groundwater OU plumes as part of the USAF IRP and are summarized in Table 5-2.

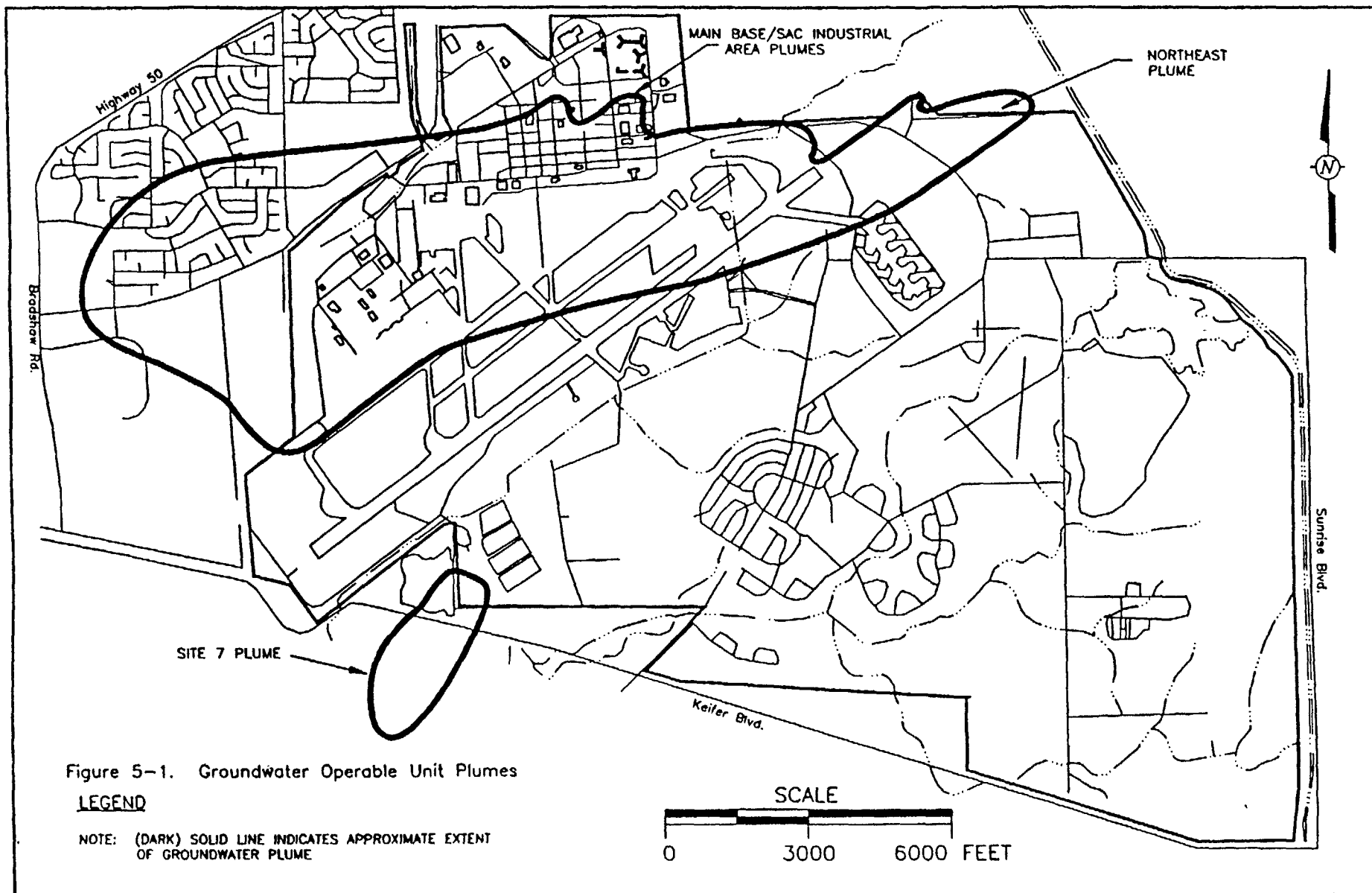
5.2.3 Highlights of Community Participation

The public participation requirement of CERCLA Sections 113(k)(2)(B)(I-v) and 117 were met through a public comment period (held May 8 through June 7, 1995) and public meeting (held May 18, 1995) to address the Proposed Plan and content of supporting RI/FS documents.

Table 5-2. Previous Investigations at the Groundwater Operable Unit Sites

Groundwater Plume	Applicable Investigation
Main Base/Strategic Air Command Industrial Area	1,2,3,4,5,6,7,8,9,10,11
Site 7	1,2,3,4,5,6,7,8,9,10,11
Northeast	1,2,3,4,5,6,7,8,9,10,11

1. Installation Restoration Program (IRP) Phase II, Stage 1 Investigation [Weston 1986];
2. IRP Phase II, Stage 2 Investigation [AeroVironment 1987];
3. IRP Phase II, Stage 3 Investigation [AeroVironment 1988];
4. Well Redevelopment and Sampling Plan [IT 1988a];
5. Quarterly Routine Groundwater Sampling [IT 1995c] and [EA 1990a-c];
6. Site Inspection Report [IT 1990a];
7. Group 2 Sites Remedial Investigation Report [IT 1992a];
8. Group 3 Sites Technical Memorandum [IT 1993a];
9. Soil Operable Unit (OU) and Groundwater OU Additional Field Investigation Report [IT 1994a];
10. Mather Baseline Risk Assessment Report [IT 1995d]; and
11. Groundwater OU and Soil OU Focused Feasibility Study Report [IT 1995a].



5.2.4 Scope and Role of Response Action

Environmental studies were initiated by the USAF in 1982 to investigate contamination resulting from past operations at the base. The USEPA placed Mather AFB on the NPL in 1989. In order to organize cleanup efforts, the base was divided into five OUs. This has allowed contaminated sites and plumes with similar sources of contamination and characteristics to be grouped together. The following sections of the ROD discuss the cleanup options for one of those OUs, the Groundwater OU. The AC&W OU ROD presented cleanup options for the AC&W plume [IT 1993e], while Sections 2.0, 3.0, and 4.0 of this ROD presents the cleanup options for the Soil OU sites, many of which overlay the contaminated groundwater plumes.

5.2.5 Summary of Site Characteristics

Contamination exists at the Groundwater OU plumes as a result of past USAF operations conducted from 1918 through 1993. The Groundwater OU plumes encompass the contaminated groundwater beneath and within the immediate vicinity of the base with the exception of the AC&W OU plume. The main sources of contamination include industrial activities, equipment maintenance, fire suppression training, landfill disposal, other disposal activities (i.e., Site 7), and fuels storage and delivery.

The objective of this section of the ROD is to address the primary contamination concerns at the Groundwater OU plumes. Previous RIs have been conducted at the Groundwater OU plumes as part of the USAF IRP. A brief description of each of the Groundwater OU plumes recommended for remedial action, including nature and extent of contamination (volume estimates are presented in Table 5-3), is provided in the following sections. Any impact to the soil overlying these plumes were addressed in separate sections of this ROD (Sections 2.0, 3.0, and 4.0).

5.2.5.1 Main Base/SAC Industrial Area Groundwater Plumes

The SAC Industrial Area Groundwater Plume and the Main Base Groundwater Plume have been grouped together for the purpose of remediation based on proximity, common contaminants, and commingling. The Group 2 Sites RI [IT 1992a] and Group 3 Sites Technical Memorandum [IT 1993a] identified a widespread chlorinated hydrocarbon plume underlying the Main Base area (Figure 5-1) which extends off-base to the west. The Main Base portion of the plume consists of several commingled plumes at the water table which have merged together in deeper hydrogeologic units and is characterized by high concentrations of PCE and lower TCE and carbon tetrachloride concentrations. Additionally, the Group 2 Sites RI and Group 3 Sites Technical Memorandum identified a dissolved-phase chlorinated hydrocarbon plume underlying the SAC area (Figure 5-1) extending from the vicinity of Site 57 off-base to the southwest [IT 1992a and IT 1993a]. The SAC Industrial area portion of the plume is characterized by high concentrations of TCE and lower PCE and

cis-1,2-dichloroethene (DCE) concentrations. The Main Base/SAC Industrial area plume is oriented northeast-southwest following the general basewide groundwater flow direction. The COCs identified are 1,1-DCE, 1,2-dichloroethane, benzene, carbon tetrachloride, chloromethane, cis-1,2-DCE, diesel, gasoline, lead, TCE, PCE, and xylenes. A cancer risk to humans has been estimated at 3.7×10^{-3} for exposure to groundwater from the SAC Industrial Area Plume and 9.3×10^{-4} for exposure to groundwater from the Main Base Plume. The basis for cleanup is protection of human health and groundwater quality.

Table 5-3. Estimates of Volume - Groundwater

Major COC	Hydrogeologic Unit	Groundwater Plume			
		Main Base**	SAC Industrial**	Northeast(1)	Site 7
		Volume* (cubic feet)	Volume* (cubic feet)	Volume* (cubic feet)	Volume* (cubic feet)
TCE	A	1.4×10^8	2.9×10^8	US	6.8×10^7
	Bu	5.4×10^7	2.2×10^8	NP	NP
	B	4.8×10^8	1.3×10^9	NA	1.5×10^8
	D	5.3×10^6	NA	NA	NA
	Total	6.8×10^8	1.8×10^9	NA	2.2×10^8
PCE	A	1.1×10^8	1.2×10^8	US	5.1×10^7
	Bu	9.5×10^7	2.4×10^8	NP	NP
	B	1.0×10^9	5.5×10^8	9.9×10^6	7.6×10^7
	D	3.9×10^8	NA	NA	NA
	Total	1.6×10^9	9.1×10^8	9.9×10^6	1.3×10^8
CCl ₄	A	3.6×10^7	2.3×10^7	US	NA
	Bu	1.9×10^7	4.4×10^7	NP	NP
	B	$1.3 \times 10^9(2)$	NA	4.6×10^6	NA
	D	1.2×10^8	NA	NA	NA
	Total	1.5×10^9	6.7×10^7	4.5×10^6	NA

TCE = Trichloroethene

COC = contaminant of concern PCE = Tetrachloroethene

SAC = Strategic Air Command CCl₄ = Carbon Tetrachloride

NP = Unit Not Present

US = Unit Unsaturated

NA = Not Applicable

(1) Hydrogeologic Unit C - PCE Contamination Volume = 9.6×10^7 cubic feet.

(2) Main Base Plume and SAC Industrial Plume volumes are reported under Main Base Plume.

* Estimates of plume size as of 1993.

** Revised estimates will be provided in the Additional Site Characterization RI Report.

5.2.5.2 Site 7 Groundwater Plume

The Group 2 Sites RI identified a chlorinated hydrocarbon plume underlying the Site 7 area (Figure 5-1) and extending off-base to the southwest [IT 1992a]. The plume is characterized by high concentrations of TCE and lower PCE and cis-1,2-DCE concentrations.

The groundwater COCs identified at the Site 7 Plume are 1,1-DCE, 1,2-dichloroethane, 1,4-dichlorobenzene, benzene, chloromethane, cis-1,2-DCE, diesel, PCE, TCE, and vinyl chloride. A cancer risk to humans has been estimated at 9.7×10^{-5} from exposure to the groundwater. Even though the cancer risk is within the acceptable range, active remediation is proposed because the risk is near the 1×10^{-4} threshold, and the plume extends approximately one mile off-base in the direction of drinking water wells. The basis for the cleanup is protection of groundwater quality and human health.

5.2.5.3 Northeast Groundwater Plume

The Group 2 Sites RI identified a chlorinated hydrocarbon plume underlying the Northeast Landfill area (Figure 5-1) [IT 1992a]. This plume is located in the northeast corner of the base, underlying Sites 3,4, and 5, and appears to have merged with the Main Base/SAC Industrial Area Plume (see Section 5.2.5.1).

The groundwater COCs identified at the Northeast Plume area are 1,2-dichloropropane, carbon tetrachloride, chloromethane, cis-1,2-DCE, and PCE. The primary source of contamination appears to be from Landfill Site Number 4. The risk assessment, using conservative assumptions and maximum concentrations, estimated the excess cancer risk for exposure to the groundwater to be 2.4×10^{-5} . The excess cancer risk is within the acceptable range (i.e., 1×10^{-6} to 1×10^{-4}) and there is no current pathway by which contaminants could endanger human health or the environment. Additionally, contaminant concentrations are expected to decrease over time.

5.2.6 Summary of Site Risks

Based on the human health risk assessment, all cancer risks are within or below the acceptable range of 1×10^{-4} to 1×10^{-6} and all non-cancer risks less than a hazard index of 1.0 in their current state, except for a localized portion of the Main Base/SAC Industrial Area Plumes. Therefore, the selected remedy will be instituted to reduce risk to human health and the environment to comply with the requirements that are ARARs based on the beneficial use of the groundwater and the site-specific conditions.

Actual or threatened releases of hazardous substances, if not addressed by implementing the response actions selected in the ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment.

5.2.7 Description of Alternatives

Two or three remedial alternatives (including the no action alternative) were developed for each of the three Groundwater OU plumes for detailed analysis in the FFS Report [IT 1995a]. Groundwater is the affected medium; any contamination in the soil overlying the groundwater plumes has been addressed as part of the Soil OU sections of this ROD (Sections 2.0, 3.0, and 4.0). Under the no action alternative, groundwater monitoring would continue under the existing basewide monitoring program.

5.2.7.1 Main Base/SAC Industrial Area Groundwater Plume Remedial Alternatives

Table 5-4 presents three remedial alternatives developed for application at the Main Base/SAC Industrial Area Groundwater Plume.

Table 5-4. Main Base/SAC Industrial Plume Remedial Alternatives

ALTERNATIVE	DESCRIPTION
Main/SAC.1	No Action (includes groundwater monitoring)
Main/SAC.2	Extraction of the contaminated groundwater with treatment by air stripping and injection of the treated groundwater into the aquifer (alternative means of discharge of treated groundwater may be implemented), and groundwater monitoring. In addition, carbon will be utilized to adsorb and treat the off-gas from the air stripper, if appropriate.
Main/SAC.3	Extraction of the contaminated groundwater with treatment by ultraviolet oxidation and injection of the treated groundwater into the aquifer (alternative means of discharge of treated groundwater may be implemented), and groundwater monitoring.

SAC = Strategic Air Command

5.2.7.2 Site 7 Groundwater Plume Remedial Alternatives

Table 5-5 presents three remedial alternatives developed for application at the Site 7 Groundwater Plume.

Table 5-5. Site 7 Plume Remedial Alternatives

ALTERNATIVE	DESCRIPTION
SP7.1	No Action (includes groundwater monitoring)
SP7.2	Extraction of the contaminated groundwater with treatment by air stripping and injection of the treated groundwater into the aquifer (alternative means of discharge of treated groundwater may be implemented), and groundwater monitoring. In addition, carbon will be utilized to adsorb and treat the off-gas from the air stripper, if appropriate.
SP7.3	Extraction of the contaminated groundwater with treatment by ultraviolet oxidation and injection of the treated groundwater into the aquifer (alternative means of discharge of treated groundwater may be implemented), and groundwater monitoring.

SP = Site 7

5.2.7.3 Northeast Groundwater Plume Remedial Alternatives

Table 5-6 presents two remedial alternatives developed for application at the Northeast Groundwater Plume. (See Section 5.2.9.3 for discussion of the selected alternative).

Table 5-6. Northeast Plume Remedial Alternatives

ALTERNATIVE	DESCRIPTION
NE.1	No Action (includes groundwater monitoring)
NE.2	Extraction of the contaminated groundwater with treatment by air stripping and injection of the treated groundwater into the aquifer (alternative means of discharge of treated groundwater may be implemented), and groundwater monitoring.
Selected Alternative	Long term groundwater monitoring and land use restrictions.

NE = Northeast

5.2.8 Summary of Comparison Analysis of Alternatives

The remedial alternatives developed in the FFS Report [IT 1995a] were analyzed in detail using the nine evaluation criteria required by the NCP (Section 300.430(e)(7)). These criteria are classified as threshold, primary balancing, and modifying criteria. In order for a remedial alternative to be selected, it must at a minimum, meet the threshold criteria.

Threshold criteria are:

- overall protection of human health and the environment; and
- compliance with ARARs.

Primary balancing criteria are:

- long-term effectiveness and permanence;
- reduction of toxicity, mobility, or volume through treatment;
- short-term effectiveness;
- implementability; and
- cost.

Modifying criteria are:

- state/support agency acceptance; and
- community acceptance.

The relative ability of each alternative to meet each of the nine criteria were weighed to identify the alternative providing the best tradeoffs for each site. The following sections summarize the nine criteria. Table 5-7 presents the results of the comparative analysis.

Table 5-7. Comparative Analysis of Groundwater Remedial Alternatives

Evaluation Criteria	Plume	Main Base/SAC Industrial Groundwater Plume			Site 7 Groundwater Plume			Northeast Groundwater Plume	
	Alternative	Main/SAC.1	Main/SAC.2*	Main/SAC.3	SP7.1	SP7.2*	SP7.3	NE.1*	NE.2
Overall Protection of Human Health and the Environment		No	Yes	Yes	No	Yes	Yes	No	Yes
Compliance with ARARs		NA**	Yes	Yes	NA**	Yes	Yes	NA**	Yes
Long-Term Effectiveness and Permanence		P	B	B	G	B	B	G	B
Reduction of Toxicity, Mobility, and Volume		P	B	B	P	B	B	P	B
Short-Term Effectiveness		F	G	B	G	G	B	G	G
Implementability		G	B	B	G	B	B	G	B
Present Worth Cost (\$ millions)		7.72	20.31	22.77	1.12	3.21	5.35	0.28	1.91

The State of California and the community concur on the selected remedial alternative* for each of the Groundwater Operable Unit plumes.

** ARARs do not have to be met unless a remedial action is taken.

P = Poor F = Fair G = Good

B = Best

SP7 = Site 7

NA = not applicable

SAC = Strategic Air Command NE = Northeast

ARAR = applicable or relevant and appropriate requirements

5.2.8.1 *Overall Protection of Human Health and the Environment*

Overall protection of human health and the environment addresses whether or not a cleanup option provides adequate protection, and it describes how risks, posed through each exposure route, are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

5.2.8.2 *Compliance with ARARs*

Addresses whether a cleanup option will meet all ARARs or federal and state environmental statutes and/or provide grounds for invoking a waiver. Applicable or relevant and appropriate requirements include cleanup and protection of groundwater quality for its beneficial use. Details of the ARARs analysis are described in Section 6.0 of this ROD.

5.2.8.3 *Long-Term Effectiveness and Permanence*

Long-term effectiveness and permanence refers to the ability of a cleanup option to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

5.2.8.4 *Reduction of Toxicity, Mobility, or Volume*

Reduction of toxicity, mobility, or volume refers to the preference for a cleanup option that uses treatment to reduce health hazards, contaminant migration, or quantity of contaminants at the site.

5.2.8.5 *Short-Term Effectiveness*

Short-term effectiveness refers to the period of time in which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period until the cleanup goals are achieved.

5.2.8.6 *Implementability*

Implementability refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to carry out a particular remedy. It also includes coordination of federal, state, and local governments in cleanup of the site.

5.2.8.7 Cost

This criterion examines the estimated cost for each remedial alternative. For comparison, capital and annual operation and maintenance costs were used to calculate a present worth cost for each alternative. The present worth cost estimates assume zero equipment salvage value, zero percent inflation, and a five percent discount factor. A detailed cost analysis was performed for each of the alternatives proposed in the FFS Report [IT 1995a].

5.2.8.8 State/Support Agency Acceptance

This indicates whether, based on its review of the RI Report [IT 1992a], FFS Report [IT 1995a], and Proposed Plan [IT 1995b], the state concurs with the preferred cleanup options. The USAF, as the lead agency, has involved the USEPA and State of California.

5.2.8.9 Community Acceptance

This is an assessment of the general public response following review of the public comments received on the RI Reports, FFS Report, and Proposed Plan during the public comment period (held May 8 through June 7, 1995) and public meeting (held May 18, 1995). Section 7.0 of this ROD contains comments received during the public comment period and responses to these comments.

5.2.9 The Selected Remedies

This section presents the remedies selected by the USAF, with concurrence by the USEPA and the State of California for each of the Groundwater OU plumes. The selected remedies were chosen based on the results of the comparative analysis of the alternatives presented in Table 5-7 and provide the best of trade-offs with respect to the nine evaluation criteria. All design and construction of the selected remedial actions will be conducted by certified professionals or under the supervision of certified professionals, as appropriate.

5.2.9.1 Main Base/SAC Industrial Area Groundwater Plume

Alternative Main/SAC.2 was selected by the USAF, with concurrence by the USEPA and the State of California as the remedy for the Main/SAC Industrial Area Groundwater Plume. The major components of this remedy include:

- a phased implementation program;
- groundwater extraction, to achieve aquifer cleanup standards, estimated but not limited to a total rate of 1,300 gallons per minute (gpm);

- treatment of the extracted groundwater through air stripping with off-gas treatment (i.e., carbon adsorption) to achieve aquifer cleanup standards MCLs (see Table 5-8), and to achieve discharge standards;
- groundwater injection per standards in Table 6-7; in combination with other discharge options that are (a) consistent with attainment of cleanup standards, and (b) cost-effective.
- land-use restrictions will be implemented on USAF property as appropriate, in order to preclude installation of groundwater wells that would not be compatible with protection of public health and the environment; and
- monitoring the groundwater.

Alternative discharge options will be evaluated during remedial design. The design will incorporate reinjection of treated groundwater and other discharge options that are (a) consistent with attainment of cleanup standards, and (b) cost-effective. The design will include contingency planning to avoid or minimize disruption of treatment operations should the primary discharge options be compromised (i.e. if reinjection capacity declines). Any means of discharge must meet substantive requirements of ARARs if onsite or be permitted as required offsite, and would be preceded by public notice and solicitation of public comment as appropriate. Examples of alternative means of discharge are:

- injection to a deeper aquifer;
- recharge through the vadose zone;
- irrigation;
- surface water discharge;
- provision of water to industrial/agricultural user(s); and
- provision of water for municipal supply.

Capital cost estimates for this remedy are projected at approximately \$5.88 million and operation and maintenance costs are estimated at \$62.72 million. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$20.31 million.

The Main Base/SAC Industrial Area Groundwater Plume cleanup levels are presented in Table 5-8.

Table 5-8. Main Base/SAC Industrial Area Plume Cleanup Levels

Contaminant of Concern	Cleanup Level (mg/L)	PRG Basis
1,2-DCA	5.0×10^{-4}	CA MCL, PQL
cis-1,2-DCE	6.0×10^{-3}	CA MCL
Benzene	1.0×10^{-3}	CA MCL
CCl ₄	5.0×10^{-4}	CA MCL, PQL
Xylenes	1.7×10^{-2}	T&O
1,1-DCE	6.0×10^{-3}	CA MCL
Chloromethane	3.0×10^{-3}	SNARL
TCE	5.0×10^{-3}	FMCL
PCE	5.0×10^{-3}	FMCL
TPH as Gasoline	5.0×10^{-2}	PQL
TPH as Diesel	1.0×10^{-1}	USEPA HA
Lead	1.5×10^{-2}	FMCL

DCA = dichloroethane

CCl₄ = carbon tetrachloride

DCE = dichloroethene

TCE = trichloroethene

PCE = tetrachloroethene

TPH = total petroleum hydrocarbon

mg/L = milligrams per liter

SAC = Strategic Air Command

T&O = taste and odor

CA MCL = California Maximum Contaminant Level

PQL = Practical Quantitation Limit

SNARL = suggested no adverse response level

FMCL = Federal Maximum Contaminant Level

USEPA HA = United States Environmental Protection Agency health advisory

5.2.9.2 Site 7 Groundwater Plume

Alternative SP7.2 was selected by the USAF, with concurrence by the USEPA and the State of California as the remedy for the Site 7 Groundwater Plume. The major components of this remedy include:

- groundwater extraction at a rate of approximately 250 gpm;
- treatment of the extracted groundwater through air stripping with off-gas treatment (i.e., carbon adsorption) to achieve aquifer cleanup standards (see Table 5-9), and to achieve discharge standards;
- groundwater injection per standards in Table 6-7; in combination with other discharge options that are (a) consistent with attainment of cleanup standards, and (b) cost-effective;
- land-use restrictions will be implemented on USAF property as appropriate, in order to preclude installation of groundwater wells that would not be compatible with protection of public health and the environment; and
- monitoring the groundwater.

Alternative discharge options will be evaluated during remedial design. The design will incorporate reinjection of treated groundwater and other discharge options that are (a) consistent with attainment of cleanup standards, and (b) cost-effective. The design will include contingency planning to avoid or minimize disruption of treatment operations should the primary discharge options be compromised (i.e. if reinjection capacity declines). Any means of discharge must meet substantive requirements of ARARs if onsite or be permitted as required offsite, and would be preceded by public notice and solicitation of public comment as appropriate. Examples of alternative means of discharge are:

- injection to a deeper aquifer;
- recharge through the vadose zone;
- surface water discharge;
- irrigation;
- provision of water to industrial/agricultural user(s); and
- provision of water for municipal supply.

Capital cost estimates for this remedy are projected at approximately \$738,309 and operation and maintenance costs are estimated at \$3.8 million. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$3.2 million.

The Site 7 Groundwater Plume cleanup levels are presented in Table 5-9.

Table 5-9. Site 7 Plume Cleanup Levels

Contaminant of Concern	Cleanup Level (mg/L)	PRG Basis
1,1-DCE	6.0×10^{-3}	CA MCL
1,2-DCA	5.0×10^{-4}	CA MCL, PQL
cis-1,2-DCE	6.0×10^{-3}	CA MCL
Benzene	1.0×10^{-3}	CA MCL
1,4-DCB	5.0×10^{-3}	CA MCL
Chloromethane	3.0×10^{-3}	SNARL
Vinyl Chloride	5.0×10^{-4}	CA MCL, PQL
TCE	5.0×10^{-3}	FMCL
PCE	5.0×10^{-3}	FMCL
TPH as Diesel	1.0×10^{-1}	USEPA HA

TPH = total petroleum hydrocarbon

DCE = dichloroethene

mg/L = milligrams per liter

PCE = tetrachloroethene

CA MCL = California Maximum Contaminant Level

SNARL = suggested no adverse response level

USEPA HA = United States Environmental Protection Agency health advisory

DCA = dichloroethane

DCB = dichlorobenzene

TCE = trichloroethene

PQL = Practical Quantitation Limit

FMCL = Federal Maximum Contaminant Level

5.2.9.3 *Northeast Groundwater Plume*

The USAF, with concurrence by the USEPA and the State of California, has decided that active remediation of the Northeast Groundwater Plume is not warranted at this time because action is being taken to remediate the source (Landfill Site 4), and because removing the low-concentration contaminants from the groundwater would provide little benefit while incurring high costs. However, because several of the contaminants are above the primary drinking water standards, institutional controls (such as deed restrictions) will be applied to prohibit the installation of groundwater supply wells on Mather AFB that would jeopardize public health or the environment from the Northeast Groundwater Plume area. If off-base groundwater wells are proposed or constructed that could result in exposure to contaminated groundwater from the Northeast Plume, the need for active cleanup or other action will be revisited. Additionally, long-term groundwater monitoring will be continued and modified as necessary to monitor contaminant concentrations. Monitoring will be conducted pursuant to Title 23, CCR, Section 2550.10 (Corrective Action Monitoring) for at least one year from the date that the levels in Table 5-10 are attained. After that time, monitoring will, as required by the Landfill ROD, be conducted pursuant to Title 23, CCR, Section 2550.8 (Detection Monitoring), in order to detect potential future releases from Landfill Site 4. Contaminant concentration levels in the groundwater will be re-evaluated annually. If the contamination concentrations drop below the levels in Table 5-10 for one year, any institutional controls may be removed. Prior to the first CERCLA five-year review, additional predictive modeling will be conducted in order to assess whether the contaminants will meet the levels in Table 5-10 within a reasonable time. The results of that modeling will be published in an appropriate document or an Explanation of Significant Difference (ESD), if necessary. If, at any time monitoring or modeling indicates that the contaminants will not meet the levels in Table 5-10 within a reasonable time, or at least forty years from the date of this ROD, or that significant migration of the contaminants may occur at levels above those in Table 5-10 which impacts public health or the environment, active remediation will be reconsidered.

No capital costs are associated with this remedy, operation and maintenance costs for long-term monitoring are estimated at \$322,399. Total cost, represented as a net present worth using a five percent discount rate, is calculated at \$279,159.

The Northeast Groundwater Plume cleanup levels are presented in Table 5-10.

Table 5-10. Northeast Plume Cleanup Levels

Contaminant of Concern	Cleanup Level (mg/L)	PRG Basis
cis-1,2-DCE	6.0×10^{-3}	CA MCL
CCl ₄	5.0×10^{-4}	CA MCL, PQL
Chloromethane	3.0×10^{-3}	SNARL
1,2-dichloropropane	5.0×10^{-3}	FMCL
PCE	5.0×10^{-3}	FMCL

DCE = dichloroethene

CCl₄ = carbon tetrachloride

CA MCL = California Maximum Contaminant Level

SNARL = suggested no adverse response level

PCE = tetrachloroethene

mg/L = milligrams per liter

PQL = Practical Quantitation Limit

FMCL = Federal Maximum Contaminant Level

5.2.10 Description of the Selected Remedies

This section is a description of the conceptual engineering features and operation of the selected remedy for the Main Base/SAC Industrial Groundwater Plume and the Site 7 Groundwater Plume. The specific design details will be determined during the remedial design phase, and hence, may differ slightly from those indicated and discussed below.

5.2.10.1 Extraction Wells

The contaminated groundwater would be pumped from the zone of interest from production wells using down-hole submersible pumps. These wells would have a combined production rate of approximately 1,300 gpm (Main Base/SAC Industrial Plume) and 250 gpm (Site 7 Plume). The influent water would flow through buried polyvinyl chloride (PVC) piping to a pre-treatment filtration unit.

5.2.10.2 Pre-Treatment Unit

The pre-treatment unit would consist of a bag-type filter. The filter bag would be capable of removing particles from the influent water that are as small as one micron. Actual specifications for the pre-treatment unit will be developed during the remedial design phase.

After passing through the pre-treatment unit, the influent would be pumped to the top of the air stripping tower. A description of the major components of the air stripping treatment unit is presented below.

5.2.10.3 Air Stripping Tower and Blower

The air stripping tower would be of a cylindrical, vertical design which will allow air flow countercurrent to the liquid flow through packing. Components of a typical air stripping tower include:

- **Spray Nozzle** - Spray nozzles are used to uniformly distribute the liquid influent over the packing to avoid channeling and dry spots.
- **Mist Eliminator** - The mist eliminator is a relatively thin bed of packing or wire mesh material. It is situated above the main packing and spray nozzles and is used to remove entrained water droplets from the exiting air stream.
- **Packing System** - Within the column of polypropylene packing material, the liquid and countercurrent air contact each other, stripping contaminants from the liquid. Over time, the packing material can become encrusted with solids suspended in the liquid influent or can be fouled with biological growth, necessitating removal and disposal. This fouling would cause gradual reduced efficiency in the removal of contaminants, as well as increasing the pressure drop through the packing resulting in decreased air flow from the blower. It is anticipated that the removal and refill of the packing material would need to be carried out only once per year. The used packing would be classified as non-hazardous waste and could be disposed in a sanitary landfill. The treated water would exit the tower and be forced by an effluent pump along the effluent line to the post-treatment infiltration unit.
- **Blower** - The supply air for the air stripping tower is provided by the blower. After contacting the liquid, the air flows out the top of the stripping tower. Here the off-gas is warmed by a heater. The heater is used to reduce the relative humidity in the air stream which increases the effectiveness of the vapor phase carbon adsorption process and reduces carbon consumption

5.2.10.4 Post-Treatment Unit

Specifications of post-treatment unit (PTU), if needed, will be developed during the remedial design phase. Purposes of the PTU will be to remove any particulates which may have formed in the treatment process, and to maintain effluent chemical properties to mitigate potential chemical, physical, or biological fouling of the aquifer and injection wells. The effluent will be pumped from the PTU to the injection wells through buried PVC pipelines.

5.2.10.5 Vapor Phase Carbon Adsorption System

Vapor phase carbon adsorption is included as part of the selected remedy to maintain capture efficiency of the contaminants present in the off-gas. There are two main types of vapor phase carbon adsorption systems which may be used in conjunction with the air stripper to remove contaminants from the off-gas stream. The first type consists of self-contained, portable activated carbon canisters. These canisters are filled with regenerated granular carbon which remove impurities from the stripper off-gas and are typically designed for installation on a concrete pad. The only installation needed is to connect the inlet from the stripper tower outlet port. The canisters can be connected in a series lead-lag configuration for increased contact times, or parallel configuration for high flowrates. The useful life of the carbon is dependent upon the concentration of the organic compounds in the gas stream, flowrate, and temperature. When the carbon becomes saturated with contaminants, the canister would be detached, sealed, and shipped for regeneration. The carbon vendor would provide shipping and regeneration as a service.

The second type of carbon system is a permanent skid-mounted structure in which single or dual beds of granular activated carbon are arranged. The system employs the same principles as the carbon canisters, however, maintenance is more involved, but because of the size difference in the carbon canister versus carbon bed, maintenance is nowhere near as frequent. Maintenance consists of removal and transport of the spent carbon to a regeneration facility, cleaning the vessel and filling the vessel with regenerated carbon. The shipping and regeneration service would be provided by the carbon vendor.

After carbon treatment, the treated vapor would be discharged to the atmosphere. The off-gas would be analyzed continuously to monitor the level of releases of organic gases to the atmosphere.

Selection of the type of carbon system will be made after further analysis in the design phase.

5.2.10.6 Discharge of Treated Water

Detailed specifications for the injection wells, including location and selection of well screen intervals, will be developed during the remedial design phase. Treated effluent will be injected into the formation using wells screened in the hydrogeologic unit of interest. Based on experience at the AC&W Site, it was found that a 2:1 ratio of injection to extraction wells is necessary for optimization of the system.

Alternative discharge options will be evaluated during remedial design. The design will incorporate reinjection of treated groundwater and evaluate reinjection in conjunction with other discharge options that are (a) consistent with attainment of cleanup standards, and (b) cost-effective. The design will include contingency planning to avoid or minimize disruption of treatment operations should the primary discharge options be compromised (i.e. if reinjection capacity declines). Any means of discharge must meet substantive requirements of ARARs if onsite or be permitted as required offsite, and would be preceded by public notice and solicitation of public comment as appropriate. Examples of alternative means of discharge are:

- injection to a deeper aquifer;
- recharge through the vadose zone using injection wells, infiltration ponds, or infiltration galleries;
- surface water discharge (i.e., storm water drainage);
- provisions of water to industrial/agricultural users;
- provisions of water for municipal supply; and
- irrigation (golf course, parks, wetlands).

All disposal alternatives will comply with discharge permit requirements, and will be documented in an ESD, if appropriate.

The selected remedy (1) prohibits the bypass or overflow of untreated or partially treated waste; (2) limits discharge to injection of treated water unless (a) additional or alternative discharge is done under applicable permit or (b) additional or alternative discharge meets the substantive requirements of applicable or relevant and appropriate regulations as agreed by the FFA parties; (3) requires that the pH of any treated water shall be between 6.5 and 8.5 or equivalent to the receiving waters.

Initial background concentration of all potential pollutants shall be determined for each water-bearing zone in which reinjection will occur. These constituents will be monitored during RA until it can be determined that there is no condition of pollution occurring as a result of the discharge. If the results necessitate the establishment of reinjection standards for additional constituents in order to meet ARARs, an amendment to the ROD or other appropriate decision procedure will be considered by the U.S. Air Force, U.S. EPA, and Cal EPA.

The selected remedy does not contemplate on-site disposal of hazardous wastes or wastes derived from the remedial action. Therefore no action-specific ARARs were selected. If

hazardous or other wastes are derived from the remedial action, such as waste water, screenings, sludges and other solids generated during construction, operation and maintenance of the treatment system, these will be disposed of off-site in accordance with applicable federal, state, and local laws, regulations, and ordinances. However, these requirements would not be considered ARARs under CERCLA, as ARARs apply only to on-site activities.

5.2.10.7 *Affected Water Supply Wells*

The Main Base/SAC Industrial Area Groundwater Plume has reached at least one water supply well beyond the base boundary and potentially could reach other wells beyond the base boundary. The current levels of contaminant constituents in the affected well are below the maximum contaminant level (MCL) safe drinking water standards promulgated by USEPA and the State but are near the one-in-a-million cancer risk level.

To address the human health threat posed by the Plume to affected water supply wells and wells that may be affected in the future due to plume migration, and to address plume migration as a result of supply wells, the USAF will develop a Mather-specific off-base Water Supply Contingency Plan in consultation with the State, USEPA, and local water agencies. The proposed Water Supply Contingency Plan will be subject to public review and comment. The USAF will submit a Draft Water Supply Contingency Plan by June 27, 1996, to the agencies and the local water agencies for review and comment. The USAFs commitment to submit a draft Contingency Plan to the other ROD signatory parties is a schedule deadline enforceable under the Mather AFB Federal Facility Agreement (FFA).

The proposed plan will address the following for each affected well or potentially affected well:

- (1) Determine which wells will likely be affected;
- (2) Provide an ongoing monitoring plan of supply wells and their guard wells, including increased frequency of sampling once a constituent from the Plume has been detected;
- (3) Determine the impact of supply well pumping on the plume and recommend action(s) to minimize plume migration;

- (4) Evaluate the short term and long term options for providing alternate water supplies (the evaluation shall consider the technical effectiveness in dealing with the health threat, implementation time frame, cost, and acceptability to the water purveyor);
- (5) Propose a preferred alternative, including an implementation time schedule, which should address the sequencing of alternate remedies if the final solution is to include short-term and long-term solutions);
- (6) Develop a trigger for ascertaining when an option(s) should be implemented;
- (7) Propose measures and an implementation schedule to mitigate the vertical migration of contaminants to deeper aquifer zones for each well likely to be impacted by the plume; and
- (8) Determine when the monitoring plan can be terminated.

USAF development of the off-base Water Supply Contingency Plan shall be subject to the consultation provisions and requirements of Section 7 of the Mather AFB FFA, effective 21 July 1989, among USEPA, the State, and the USAF. For purposes of Section 7 of the Mather AFB FFA, the Contingency Plan shall be considered a primary document.

The State reserves any rights it would otherwise have, absent this ROD or the Mather FFA, with respect to the impact of the plume on any affected well or other likely affected wells. This reservation of rights expires upon concurrence with the final contingency plan. The Air Force intends, aside from this ROD and within any necessary constraints of the Federal Tort Claims Act, to work with affected parties, Sacramento County, and the State regarding immediate needs to abate impacts of the plume. Nothing stated in this ROD shall be construed as an admission by the Air Force of tort liability.

5.2.11 *Performance Evaluations*

The Air Force will develop monitoring, reporting, and notification programs during the RD/RA phase. The monitoring program shall include sufficient monitoring (both in terms of location, frequency, and test methods) to evaluate the effectiveness of the RA and ensure that discharge standards for effluent reinjection or other approved discharge are being met.

Periodic performance evaluation reports will present groundwater monitoring data. The evaluation reports shall demonstrate that the capture zones of the extraction wells are consistent with attainment of the aquifer cleanup standards, and that the injection of treated groundwater does not degrade the receiving water quality.

In addition to operational monitoring of influent and air emissions, routine sampling of the groundwater will be conducted to monitor the migration of the contaminated plumes and decreases in the concentrations. Specific sampling, analysis, and monitoring requirements will be established during the remedial design. This data will be utilized to evaluate the need for institutional control as well as to periodically evaluate the performance of the remedial system.

Five-Year Site Reviews and periodic performance evaluations, as recommended by USEPA, are to be included as a component of the selected remedy. The specific schedule for periodic performance evaluations will be determined during the remedial design phase. However, USEPA recommends an initial evaluation to be conducted one to two years after the remedy is operational and functional, in order to determine whether modifications to the restoration action are necessary. The USEPA also recommends that more extensive performance evaluations be conducted at least every five years [55 Federal Register (FR) 8740]. The purpose of the evaluations is to determine whether cleanup levels have been, or will be, achieved in the desired time frame. After the evaluations are completed, the following options should be considered:

- discontinue operations;
- upgrade or replace the remedial action to achieve the original remedial action objectives or modified remedial action objectives; and/or
- modify the remedial action objectives and continue remediation, if appropriate [55 FR 8740].

5.2.12 Statutory Determinations

The selected remedies satisfy the statutory requirements in CERCLA Section 121(b), as amended by SARA, in that the following mandates are attained:

- the selected remedies are protective of human health and the environment, will decrease site risks, and will not create short-term risks nor have cross-media consequences;

- the selected remedies comply with federal and state requirements that are applicable, or relevant and appropriate, to the remedial actions;
- the selected remedies are cost-effective in their fulfillment of the nine CERCLA evaluation criteria; and
- the selected remedies utilize permanent solutions to the maximum extent practicable.

6.0 List of Applicable or Relevant and Appropriate Requirements and To-Be-Considereds

Pursuant to Section 121(d)(1) of CERCLA, remedial actions must attain a degree of cleanup which assures protection of human health and the environment. Additionally, remedial actions that leave hazardous substances, pollutants, or contaminants onsite must meet standards, requirements, limitations, or criteria that are ARARs. Federal ARARs include requirements under any federal environmental laws, while state ARARs include promulgated requirements under state environmental or facility-siting laws that are more stringent than federal ARARs, and that have been identified to USEPA by the State of California in a timely manner.

Applicable requirements are those cleanup standards, control standards, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. In general, onsite actions need comply only with the substantive aspects of ARARs, not with corresponding administrative requirements (such as, but not limited to, permits, recordkeeping, and reporting).

Relevant and appropriate requirements include those that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, nevertheless address problems or situations sufficiently similar to those encountered at the CERCLA site to indicate their use is well-suited to the particular site. A requirement must be either applicable or both relevant and appropriate to be an ARAR. If no ARAR addresses a particular situation, or if an ARAR is insufficient to protect human health or the environment, then nonpromulgated standards, criteria, guidance, and TBC advisories may be used to develop a protective remedy.

Applicable or relevant and appropriate requirements are identified on a site-specific basis from information about site-specific chemicals, specific actions that are being considered as remedies, and specific features of the site location. There are three categories of ARARs:

- Chemical-specific ARARs are numerical values or methodologies which, when applied to site-specific conditions, result in the establishment of numerical values. They are used to determine acceptable concentrations of specific hazardous substances, pollutants, and contaminants in the environment;

- Location-specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because the site occurs in, or may affect, a special location, such as a wetland or floodplain; and
- Action-specific ARARs are technology- or activity-based requirements or limitations on actions taken with respect to hazardous waste.

The ARARs and TBCs were developed using the following guidelines and documents: CERCLA Compliance with Other Laws Manual, Part I: Interim Final [USEPA 1988]; "CERCLA Compliance with Other Laws Manual, Part II: Clean Water Act and Other Environmental Statutes and State Requirements" [USEPA 1989b]; and "California State Water Resources Control Board ARARs Under CERCLA" [SWRCB 1992]. The following sections outline the ARARs and other information considered for the Soil OU sites where remedial actions will be initiated (listed in Section 2.0 of this ROD) and Groundwater OU plumes (listed in Section 5.0 of this ROD)

The following sections present the federal and state regulations and guidance under each appropriate ARAR category (i.e. chemical-, location-, and action-specific). Chemical-specific ARARs and TBCs are listed in Section 6.1, location-specific ARARs and TBCs are listed in Section 6.2, and action-specific ARARs and TBCs are listed in Section 6.3.

6.1 Chemical-Specific ARARs and TBCs

Chemicals of concern for the Soil OU sites and Groundwater OU plumes are listed in the following sections. These COCs were identified for soils (i.e., sediments, surface soils, and subsurface soils), surface water, and groundwater. The chemical-specific ARARs and TBCs for these COCs are presented based on whether they are ARARs or TBCs, the type of contamination, and applicable media.

6.1.1 Federal Chemical-Specific ARARs and TBCs

The following federal chemical-specific ARARs and TBCs have been identified for the Soil OU sites and Groundwater OU plumes.

6.1.1.1 Soils

The only federal ARAR is USEPA Toxic Substance Control Act (TSCA), implemented through 40 Code of Federal Regulations (CFR) Part 761.120-135, which applies to sites where the soil contains greater than 50 mg/kg total PCB and the spill occurred after February 17, 1978. The TSCA is a TBC for the Site 15 contaminated sediments, because PCB concentrations do not

not exceed 50 mg/kg. The date(s) the PCBs were released to the soils at Mather AFB is not known, so these requirements are considered relevant and appropriate for establishing chemical-specific COC limits. 40 CFR Part 761 is also identified in Section 6.3.1.1 as a chemical-specific TBC for Site 15 soils.

6.1.1.2 Surface Waters

Sites 13, 15, and 69 have identified surface waters at which the following TBCs would apply. Federal AWQC for the protection of freshwater aquatic life and human health were used for the development of cleanup standards for on-base surface waters (Table 6-1). These sites consist of ditches which are tributaries to the Sacramento River, which have beneficial use designation of municipal water supply and aquatic habitat.

Table 6-1. Chemical-Specific TBCs for Surface Water

Chemical	Concentration (mg/L)	Site Number
Aluminum	8.7×10^{-2} (1)	13
Barium	1.0×10^0 (2)	69
Chromium	1.1×10^{-2} (1)	13, 15
Lead	9.9×10^{-4} (1)	13, 15
Manganese	5.0×10^{-2} (3)	13, 15, 69
Silver	1.2×10^{-4} (1)	13
Vanadium	1.0×10^{-1} (4)	15
Zinc	4.9×10^{-2} (1)	13, 15

TBC = to-be-considered materials

mg/L = milligrams per liter

- (1) U. S. Environmental Protection Agency National Ambient Water Quality Criteria, Freshwater Aquatic Life Protection, Recommended Criteria, Continuous Concentration (four-day average).
- (2) U. S. Environmental Protection Agency National Ambient Water Quality Criteria, Health and Welfare Protection, Non-Cancer Public Health Effects.
- (3) U. S. Environmental Protection Agency National Ambient Water Quality Criteria, Health and Welfare Protection, Taste and Odor or Welfare.
- (4) Agricultural Water Quality Goals

California Regional Water Quality Control Board Central Valley Region (CVRWQB), 1993, "A Compilation of Water Quality Goals," Sacramento, California.

6.1.1.3 Groundwater

Section 121 of CERCLA indicates that remedial actions shall attain federal WQG or AWQC where they are relevant and appropriate. National Primary Drinking Water regulation, 40 CFR Part 141, established MCLs and MCL goals for organic and inorganic constituents as ARARs.

6.1.2 State Chemical-Specific ARARs and TBCs

The following State of California chemical-specific ARARs and TBCs have been identified.

6.1.2.1 Soils

There are no state chemical-specific ARARs for COCs found in the soils for the Soil OU sites. To assure protection of human health and the environment chemical-specific TBCs were developed from WQGs [CVRWQCB 1993]. The WQG was used as the regulatory factor for each COC identified at a site. The WQG was multiplied by a leachability factor and an environmental attenuation factor which are based on site-specific characteristics to develop a TDL for each site-specific COC. The TDL methodology is described in the DLM guidance document [CVRWQCB 1989]. The TBCs established for sediments, surface soils, and subsurface soils are listed in Tables 6-2 through 6-4, respectively.

6.1.2.2 Surface Waters

There are no state chemical-specific ARARs or TBCs identified for surface waters. The federal TBCs listed in Section 6.1.1.2, Table 6-1 were the most stringent requirements identified for surface waters.

The beneficial uses of Mather Lake and Morrison Creek are not designated in the Basin Plan specifically. However, the Basin Plan indicates that the beneficial use of these surface water bodies should be municipal supply. Further, as a tributary of the Sacramento River, Morrison Creek is assumed to have the same uses as the river (that is, municipal, agricultural, recreational, and aquatic habitat). Based on this use-analysis, narrative standards for taste and odor thresholds are considered TBC requirements.

6.1.2.3 Groundwater

The Porter-Cologne Water Quality Control Act is one of the statutory bases for remediation of contaminants that threaten water quality in California. It establishes the authority of the State Water Resources Control Board (SWRCB) and the CVRWQCB to protect the quality of surface water and groundwater in California.

State Water Resources Control Board Resolution 68-16 has been identified as an applicable requirement for the protection of surface water and groundwater of the state. The USAF and the state do not agree on the full applicability of all the substantive requirements contained within the resolution and the impact on the remedial activities needed to cleanup Mather AFB. The USAF disagrees with the State's contention that the narrative language establishes chemical-specific ARARs for both soil and groundwater, and that discharges subject to the resolution include post-1968 migration of in situ contamination from the vadose zone to

Table 6-2. Chemical-Specific ARARs and TBCs for Sediments

Chemical	Concentration (mg/kg)	Site Number
ARAR		
PCBs (Aroclor 1248, 1254, and 1260)	5.0×10^1	15
TBC*		
Acenaphthene	5.2×10^0	15
Acenaphthylene	2.8×10^{-5}	15
Anthracene	2.8×10^{-5}	15
Benzo(a)anthracene	2.8×10^{-5}	15
Benzo(a)pyrene	2.8×10^{-5}	15
Benzo(b)fluoranthene	2.8×10^{-5}	15
Benzo(g,h,i)perylene	2.8×10^{-5}	15
Benzo(k)fluoranthene	2.8×10^{-5}	15
Chlordane (alpha and gamma)	5.7×10^{-6}	13, 15
Chrysene	2.8×10^{-5}	15
4,4-DDD	8.3×10^{-5}	13
4,4-DDE	5.9×10^{-5}	13
4,4-DDT	5.9×10^{-5}	13
Dibenzo(a,h)anthracene	2.8×10^{-5}	15
Dieldrin	1.4×10^{-6}	13, 15
Diesel	1.0×10^0	15
Fluoranthene	3.7×10^0	15
Fluorene	2.8×10^{-5}	15
Gasoline	5.0×10^{-2}	15
Indeno(1,2,3-cd)pyrene	2.8×10^{-5}	15
Naphthalene	6.2×10^0	15
Phenanthrene	6.3×10^{-2}	15
Pyrene	9.6×10^0	15
2,3,7,8-TCDD equivalent	(1)	69
TBC*		
Arsenic	1.8×10^{-3}	13
Barium	1.0×10^2	15
Cadmium	5.5×10^{-2}	15
Chromium VI	1.1×10^0	13, 15
Chromium, Total	1.1×10^0	13, 15
Cobalt	5.0×10^0	13
Copper	1.3×10^3	13, 15

Table 6-2. Chemical-Specific ARARs and TBCs for Sediments (Continued)

Chemical	Concentration (mg/kg)	Site Number
TBC* (Continued)		
Lead	9.9×10^{-2}	13, 15
Mercury	1.2×10^{-3}	13, 15
Nickel	7.3×10^0	13
Vanadium	1.0×10^1	13
Zinc	4.9×10^1	13
	4.9×10^0	15

TBC = to-be-considered material

PCB = polychlorinated biphenyls

DDD = Dichlorodiphenyldichloroethane

DDT = Dichlorodiphenyltrichloroethane

ARAR = applicable or relevant and appropriate requirement

TCDD = tetrachlorodibenzo-p-dioxin

DDE = Dichlorodiphenyldichloroethene

mg/kg = milligrams per kilogram

(1) A Leachability Factor was not assigned and the total designated level was not calculated.

California Regional Water Quality Control Board Central Valley Region (CVRWQB), "A Compilation of Water Quality Goals," 1993, Sacramento, California.

* Designated Level Methodology (DLM) value varies with site conditions (e.g., depth to groundwater) and appropriate water quality objective. Appendix E of the Groundwater Operable Unit and Soil Operable Unit Focused Feasibility Study Report [IT 1995a] shows how the site-specific DLM-based values were derived, using appropriate leachability and environmental attenuation factors.

Table 6-3. Chemical-Specific TBCs for Surface Soils

Chemical	Concentration (mg/kg)	Site Number
TBC*		
Benzo(a)anthracene	1.0×10^{-1}	13, 56
Benzo(a)pyrene	2.0×10^{-1}	56
Benzo(b)fluoranthene	2.0×10^{-1}	56
Benzo(g,h,i)perylene	2.8×10^{-3}	13
Benzo(k)fluoranthene	2.0×10^{-1}	62
Chrysene	2.0×10^{-1}	56
Dibenzo(a,h)anthracene	3.0×10^{-1}	56
Fluoranthene	4.2×10^1 (2)	13, 62
Indeno(1,2,3-cd)pyrene	4.0×10^{-1}	13
Naphthalene	2.0×10^1	13, 62
Pyrene	9.6×10^2 (2)	13, 62
2,3,7,8-TCDD equivalent, total	(1)	11, 69
Trichloroethene	5.0×10^0	57
Diesel	1.0×10^2	13, 39, 56, 62, 65

Table 6-3. Chemical-Specific TBCs for Surface Soils (Continued)

Chemical	Concentration (mg/kg)	Site Number
Arsenic	5.0×10^2	13, 56
Barium	1.0×10^4	69
Cadmium	5.0×10^1	62
Chromium, Total	5.0×10^2	65
Lead	1.5×10^2	13, 20, 39, 56, 62, 65
Manganese	5.0×10^2	69
Mercury	2.0×10^1	13, 20
Zinc	5.0×10^5	13, 20, 62, 69

TBC = to-be-considered material
mg/kg = milligrams per kilogram

TCDD = tetrachlorodibenzo-p-dioxin

- * The Designated Level Methodology (DLM) value varies with site conditions (e.g., depth to groundwater) and appropriate water quality objective. Appendix E of the Groundwater Operable Unit and Soil Operable Unit Focused Feasibility Study Report [IT 1995a] shows how the site-specific DLM-based values were derived, using appropriate leachability and environmental attenuation factors.

California Regional Water Quality Control Board Central Valley Region (CVRWQB), "A Compilation of Water Quality Goals," 1993, Sacramento, California.

- (1) A leachability factor was not assigned and the total designated level was not calculated.
- (2) Water quality goal number for fluoranthene is 42 $\mu\text{g}/\ell$, California Inland Surface Waters Plan Numerical Water Quality Objectives, Human Health Protection (30-day average) Sources of Drinking Water; pyrene is 960 $\mu\text{g}/\ell$, United States Environmental Protection Agency Ambient Water Quality Criteria, Health and Welfare Protection, Non-Cancer Public Health Effects.

groundwater. The USAF believes that only active discharges directly to surface water or groundwater of the state are subject to the provisions of SWRCB Resolution 68-16.

The CVRWQCB Basin Plan [CVRWQCB 1995] for Sacramento-San Joaquin Basin contains chemical-specific requirements that pertain to the Mather AFB area. The Basin Plan [CVRWQCB 1995] designates the beneficial uses of the groundwater in the Mather AFB area as domestic, municipal, irrigation, stock water, process, and service supply waters. Based on these uses, narrative standards for taste and odor thresholds are ARARs, but associated numerical goals are TBCs for these ARARs. The Basin Plan also establishes the following qualitative chemical-specific ARARs based on the designated use(s) of the groundwater: the domestic or municipal water supply shall not contain concentrations of chemicals in excess of state required MCLs; and the agricultural water supply shall not contain concentrations of

constituents that adversely affect its beneficial use. Table 6-5 lists the ARARs and TBCs for drinking water and groundwater.

Table 6-4. Chemical-Specific TBCs for Subsurface Soils

Chemical	Concentration (mg/kg)	Site Number
TBC*		
Benzene	1.0×10^{-1}	39, 54
Benzo(a)pyrene	2.0×10^{-2}	62
Chlordane (alpha and gamma)	1.0×10^{-2}	13
4,4-DDE	1.0×10^{-1}	13
4,4-DDT	1.0×10^0	13
Diesel	1.0×10^1	7, 13, 20, 37, 39, 59, 62, 65
	1.0×10^2	15, 56
Ethylbenzene	2.9×10^0	39
Fluoranthene	1.4×10^3	62
Gasoline	5.0×10^{-1}	7, 39, 54, 59, 65
	5.0×10^0	56, 60
Pyrene	1.05×10^2	62
Toluene	4.2×10^0	39
Trichloroethene	5.0×10^{-2}	57
Xylenes	1.7×10^0	39
	1.7×10^1	60
Cadmium	5.0×10^0	62
Lead	1.5×10^1	7, 13, 37, 65
	1.5×10^2	56
Mercury	2.0×10^0	13
	2.0×10^1	15
Thallium	2.0×10^0	7

TBC = to-be-considered material

DDE = dichlorodiphenyldichloroethene

DDT = dichlorodiphenyltrichloroethane

mg/kg = milligrams per kilogram

California Regional Water Quality Control Board Central Valley Region (CVRWQB), "A Compilation of Water Quality Goals," 1993, Sacramento, California.

* Designated level methodology value varies with site conditions (e.g., depth to groundwater) and appropriate water quality objective. Appendix E of the Groundwater Operable Unit and Soil Operable Unit Focused Feasibility Study Report [IT 1995a] for how the site-specific DLM-based values were derived, using leachability and environmental attenuation factors.

Table 6-5. Chemical-Specific ARARs and TBCs for Drinking and Groundwater

Chemical	Concentration (mg/L)	Plumes
ARAR		
Benzene	1.0×10^{-3} (1)	MB/SAC, 7
Carbon Tetrachloride	5.0×10^{-4} (1)	MB/SAC, NE
1,4-Dichlorobenzene	5.0×10^{-3} (1)	7
1,2-Dichloroethane	5.0×10^{-4} (1)	MB/SAC, 7
1,1-Dichloroethene	6.0×10^{-3} (1)	MB/SAC, 7
cis-1,2-Dichloroethene	6.0×10^{-3} (1)	MB/SAC, 7, NE
1,2-Dichloropropane	5.0×10^{-3} (2)	NE
Tetrachloroethene	5.0×10^{-3} (2)	MB/SAC, 7, NE
Trichloroethene	5.0×10^{-3} (2)	MB/SAC, 7
Vinyl Chloride	5.0×10^{-4} (1)	7
Xylenes	1.75×10^0 (1)	MB/SAC
Lead	1.5×10^{-2} (2)	MB/SAC
TBC		
Chloromethane	3.0×10^{-3} (4)	MB/SAC, 7, NE
TPH as Diesel	1.0×10^{-1} (3)	MB/SAC, 7
TPH as Gasoline	5.0×10^{-3} (3)	MB/SAC

TBC = to-be-considered material

mg/L = milligrams per liter

SAC = Strategic Air Command

MB = Main Base

7 = Site 7

NE = Northeast

TPH = total petroleum hydrocarbon

ARAR = applicable or relevant and appropriate requirement

- (1) Drinking Water Standards (California and Federal) Maximum Contaminant Levels (MCL), California Department of Health and Services, Primary MCL.
- (2) Drinking Water Standards (California and Federal) MCL, U.S. Environmental Protection Agency (USEPA), Primary MCL.
- (3) Other Taste and Odor Thresholds.
- (4) Health Advisories or Suggested No-Adverse-Response Levels for toxicity other than cancer risk, USEPA.

California Regional Water Quality Control Board Central Valley Region (CVRWQB), "A Compilation of Water Quality Goals," 1993, Sacramento, California.

6.2 Location-Specific ARARs and TBCs

Location-specific ARARs and TBCs are requirements that place restrictions on the concentration of a COC or the conduct of activities because of the presence of unique site features such as surface waters and wetlands. The location of the Soil OU sites were analyzed for unique site features to identify location-specific ARARs. The unique site

features considered were:

- surface water;
- floodplain and wetlands;
- habitats of rare, threatened, endangered, and special status species;
- earthquake faults;
- historically or culturally significant properties;
- wilderness areas;
- wild and scenic rivers; and
- coastal zones.

Of these unique site features, surface water occurs at or near: Site 13 (Drainage Ditch Number 1), Site 15 (Drainage Ditch Number 3), and Site 69 (Open Burn Pit). Portions of Site 7 may be located within the 100-year floodplain of Morrison Creek. Vernal pools and seasonal wetlands, some of which are known to contain endangered species, have been identified at Mather AFB. However, currently there has been no documentation that there are wetlands likely to harbor endangered species at or near any of the remedial actions selected by this ROD. The existence of wetlands and endangered species will be considered during remedial design to avoid or minimize impact during activities such as location of electrical conduit and water pipes associated with groundwater treatment systems. No other unique site features were identified.

6.2.1 Federal Location-Specific ARARs

The Endangered Species Act and implementing regulations at 50 CFR 17, 222, 226, 227, and 402, apply to some of the remedial actions at Mather AFB, if they impact endangered wildlife. These impacts may be identified by a final biological assessment finding that the vernal pools on Mather AFB, do contain an endangered species. No vernal pools have been identified in the vicinity of any of the Soil OU sites, for which remedial action is selected in this ROD. The direct cleanup activities are not expected to impact any endangered species; however, associated cleanup activities (i.e., construction of pipelines for groundwater injection) may impact habitat or critical resources. All activities must ensure that regulatory requirements are followed and impacts avoided or mitigated.

6.2.2 State Location-Specific ARARs

The Fish and Game Code Section 1600 requires that any work within the 100-year floodplain (consisting of, but not limited to, diversion or obstruction of the natural flow or changes in the

channel, bed, or bank of any river, stream or lake) will involve mitigation measures to avoid or minimize impacts on natural resources. Portions of Site 7 may be located within the 100-year floodplain; certain provisions of the Fish and Game Code Section 1600 would be relevant and appropriate for this site if the site is actually located in the 100-year floodplain.

6.3 Action-Specific ARARs and TBCs

Action-specific ARARs are technology or activity-based requirements or limitations on actions taken with respect to the hazardous waste. The following sections describe the state and federal action-specific ARARs and TBCs. All ARARs are listed in Table 6-6 with each substantive requirement identified as either applicable or relevant and appropriate. Several of the requirements are marked with a footnote giving clarification to either their ARAR status or the legal interpretation of why they are considered ARARs for a particular site or remedial action. The TBCs are presented at the federal or state level in Sections 6.3.1.1 and 6.3.2.4. Sections 6.3.1 and 6.3.2 include a description of the sources of the action-specific ARAR regulations and the regulatory authority the agencies have to enforce these requirements. In addition, the USAF position on substantive requirements of ARARs and how they apply to the selected remedial actions are described.

6.3.1 Federal ARARs

The following federal action-specific ARARs and TBCs have been identified. The federal action-specific ARARs are listed in Table 6-6, TBCs are listed in Sections 6.3.1.1 and 6.3.2.4 and a brief description of the sources of action-specific ARARs are provided in this section.

The Federal Safe Drinking Water Act regulates the injection of waste into injection wells. These wells are identified by unique characteristics such as depth, location of drinking water source, and material injected. Forty CFR 144 - Underground Injection Control Program is the regulation listing the requirements for the operation and use of injection wells.

The California DTSC regulations promulgated under the Hazardous Waste Control Law (HWCL) are applicable to RCRA-permitted storage facilities and proper characterization of hazardous waste, and storage and disposal of such waste. There is only one RCRA permitted facility (Site 37/39/54 - Building 3389/Hazardous Waste Central Storage Facility) being closed under the remedial actions and there is no intention of building any to support the cleanup activities. If any hazardous waste is identified, it will be disposed of and handled under the permit by rule provisions of RCRA with treatment to render non-hazardous or disposed offsite. Other HWCL provisions are relevant and appropriate to treatment systems, such as ex situ bioremediation treatment cells, where soils are managed. Many of the HWCL provisions are both relevant and appropriate because they describe requirements for the safe handling of contaminated materials and precautions for preventing further contamination.

Table 6-6. Action Specific ARARs

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
<i>Federal ARARs</i>			
Federal Safe Drinking Water Act	40 CFR 144 - Underground Injection Control Program	Applicable	USEPA established substantive requirements for actions that involve injection of fluids into subsurface through wells. The injection can not cause a violation of primary MCLs, must be maintained, must be monitored, and injection can not take place until the well construction is complete. This regulation applies to the technology selected for the cleanup of Main/SAC and Site 7 groundwater plumes.
California Hazardous Waste Control Law	Title 22, Division 4.5 (Environmental Health Standards for Management of Hazardous Waste), Chapter 12 (Standards Applicable to Generators of Hazardous Waste), Article 1 (Applicability)	Subsection(s) as Listed Below	Establishes standards for generators of hazardous waste located in California. Only applicable if the wastes from excavated sites or treatment processes are classified as hazardous or non-RCRA hazardous waste, and the remedial action constitutes treatment, storage, or disposal of hazardous waste.
	22 CCR 66262.11	Applicable	
California Hazardous Waste Control Law	Title 22, Division 4.5 (Environmental Health Standards for Management of Hazardous Waste), Chapter 14 (Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities), Article 6 (Water Quality Monitoring and Response Programs for Permitted Facilities)	Subsection(s) as Listed Below	These standards are applicable to permitted hazardous waste facilities. Owners or operators of permitted hazardous waste facilities must monitor the groundwater during the closure and post-closure periods. Groundwater Monitoring Requirements (22 CCR 66264.97): Groundwater needs to be monitored during the closure and post-closure periods at permitted RCRA/HWCL facilities. Corrective action monitoring (22 CCR 66264.100) is conducted if there is a corrective action. The concentration limit (22 CCR 66264.94(a)) may be background or established based on threats to human health and the environment. If all of the wastes and contaminated materials are removed from a waste management unit, monitoring should be continued until the groundwater results indicate that all water levels are in compliance with the water quality standard for three consecutive years (22 CCR 66264.96(c)). These regulation sections are applicable to any RCRA corrective action at the treatment facility, Site 39, which was the Hazardous Waste Central Storage Facility, which was permitted under RCRA.
	22 CCR 66264.94(a)	Applicable	
	22 CCR 66264.96 ^o	Applicable	
	22 CCR 66264.97	Applicable	
	22 CCR 66264.100	Applicable	

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
California Hazardous Waste Control Law	Title 22, Division 4.5 (Environmental Health Standards for Management of Hazardous Waste), Chapter 14 (Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities), Article 7 (Closure and Post-Closures)	Subsection(s) as Listed Below	<p>Closure Performance Standard (22 CCR 66264.111): Closure of a permitted hazardous waste facility should minimize the need for maintenance of the facility, and control, minimize, or eliminate emissions of hazardous chemicals into the environment.</p> <p>Content of Closure Plan (22 66264.112(b)): All substantive steps required for closure of the facility should be planned prior to beginning site activities. The time required for each step should be estimated. Disposal or Decontamination of Equipment, Structure and Soils (22 CCR 66264.114): All contaminated equipment, structures, and soils shall be properly disposed of or decontaminated. Post-Closure Care and Use of Property (22 CCR 66264.117): Unless the contamination is totally removed, monitoring and maintenance of the facility must be continued. Post-closure uses shall never disturb containment systems or monitoring equipment.</p> <p>These regulation sections are applicable to the corrective action under taken for facility closure at the treatment facility, Site 39, which was the Hazardous Waste Central Storage Facility, which was permitted under RCRA.</p>
	22 CCR 66264.111	Applicable	
	22 CCR 66264.112(b)	Applicable	
	22 CCR 66264.114	Applicable	
	22 CCR 66264.117	Applicable	
California Hazardous Waste Control Law	Title 22, Division 4.5 (Environmental Health Standards for Management of Hazardous Waste), Chapter 14 (Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities), Article 9 (Use and Management of Containers)	Subsection(s) as Listed Below	<p>The chemicals recovered from the sediments, surface soils, subsurface soils, or groundwater may need to be managed as either a RCRA or non-RCRA hazardous waste. The treatment, storage, and disposal requirements for these wastes are either applicable or relevant and appropriate (depending upon the classification of the waste material) and they include: using containers to store the recovered product that are compatible with this material (22 CCR 66264.172); using containers that are in good condition (22 CCR 66264.171); segregating the waste from incompatible wastes (22 CCR 66264.177); inspect the containers (22 CCR 66264.174); isolating the waste from sources of ignition (if the material is ignitable) and (22 CCR 66264.176); providing adequate secondary containment for the waste stored (22 CCR 66264.175); containers must be closed during transfer (22 CCR 66264.173); and all hazardous material must be removed at closure (22 CCR 66264.178).</p> <p>If during excavation, treatment processes, or cleanup activities hazardous waste is identified through the proper characterization process, the hazardous waste will be managed in accordance with the standards stated in these sections of the regulation.</p>
	22 CCR 66264.171	Applicable	
	22 CCR 66264.172	Applicable	
	22 CCR 66264.173	Applicable	
	22 CCR 66264.174	Applicable	
	22 CCR 66264.175	Applicable	
	22 CCR 66264.176	Applicable	
	22 CCR 66264.177	Applicable	
	22 CCR 66264.178	Applicable	

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
California Hazardous Waste Control Law	Title 22, Division 4.5 (Environmental Health Standards for Management of Hazardous Waste), Chapter 14 (Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities), Article 12 (Waste Piles)	Subsection(s) as Listed below	Delineates requirements for the management of waste piles for hazardous waste. This regulation is applicable to sites where excavated materials are classified as hazardous wastes and managed in waste piles. The titles of the regulations are Section 66264.251. Design and Operating Requirements; Section 66264.254. Monitoring and Inspection; Section 66264.256. Special Requirements for Ignitable or Reactive Waste; Section 66264.257. Special Requirements for Incompatible Wastes; Section 66264.258. Closure and Post-Closure Care; and Section 66264.259. Special Requirements for Hazardous Wastes F020, F021, F022, F023, F026, and F027.
	22 CCR 66264.251	Applicable	If during excavation, treatment processes, or cleanup activities, hazardous waste is identified through the proper characterization process, and will be managed in waste piles, the hazardous waste will be managed in accordance with the standards stated in these sections of the regulation.
	22 CCR 66264.254	Applicable	
	22 CCR 66264.256	Applicable	
	22 CCR 66264.257	Applicable	
	22 CCR 66264.258	Applicable	
	22 CCR 66264.259	Applicable	
California Hazardous Waste Control Law	Title 22, Division 4.5 (Environmental Health Standards for Management of Hazardous Waste), Chapter 14 (Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities), Article 19 (Corrective Action for Waste Management Units)	Subsection(s) as Listed Below	CAMU: Placement, consolidation, and treatment of soils and wastes being generated as part of a corrective action under RCRA will not be considered a new disposal to land as long as the materials are handled in designated CAMUs. Land disposal restrictions (22 CCR 66268) are not invoked when remediation wastes are managed at a CAMU. A CAMU can only be used for the management of remediation wastes pursuant to implementing corrective actions at the facility. USEPA intended that the Federal CAMU rule be considered for the management of wastes generated at CERCLA sites. Excavation of wastes from the discharge and disposal sites might be managed at a CAMU for on-base disposal, or ex situ bioremediation. A CAMU is an area within a facility for the purpose of implementing corrective actions. Uncontaminated areas are allowed to be designated as part of a CAMU when they are necessary to achieve the overall goals for the facility and will enhance the protectiveness of the remedial action. The CAMU rule allows consolidation and treatment of wastes in a single unit, from other areas of the facility, without triggering minimum technology requirements and LDR found in other provisions of RCRA and HWCL: that is, placement of wastes into a CAMU is not considered land disposal and redeposition of treated wastes into the CAMU does not trigger the LDRs. Groundwater must be monitored at the CAMU in order to detect and characterize a release.
	22 CCR 66264.552	Relevant and Appropriate	If during excavation, treatment processes, or cleanup activities hazardous waste is identified through the proper characterization process, and will be managed in waste piles, the hazardous waste will be managed in accordance with the standards stated in these sections of the regulation.
	22 CCR 66264.553	Relevant and Appropriate	

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
California Hazardous Waste Control Law	Title 22, Division 4.5 (Environmental Health Standards for Management of Hazardous Waste), Chapter 18 (Land Disposal Restrictions), Article 1 (General)	Subsection(s) as Listed Below	Provides the purpose, scope, and applicability of LDRs. The title of the sections of the regulations are; Section 66268.3. Dilution Prohibited As a Substitute for Treatment; Section 66268.7. Waste Analysis and Record keeping; and Section 66268.9. Special Rules Regarding Wastes That Exhibit a Characteristic.
	22 CCR 66268.3	Applicable	If during excavation, treatment processes, or cleanup activities hazardous waste is identified through the proper characterization process, and will be managed in waste piles, the hazardous waste will be managed in accordance with the standards stated in these sections of the regulation. Only applicable if hazardous wastes are disposed of or treated in an area not designated as a CAMU or disposed of or treated beyond the area of contamination.
	22 CCR 66268.7(a) & (b)	Applicable	
	22 CCR 66268.9	Applicable	
California Hazardous Waste Control Law	Title 22, Division 4.5 (Environmental Health Standards for Management of Hazardous Waste), Chapter 18 (Land Disposal Restrictions), Article 3 (Prohibitions on Land Disposal)	Subsection (s) as Listed Below	These standards are applicable to sites where excavated material is classified as hazardous waste and is disposed of or treated in an area not designated as a CAMU. Provides waste-specific LDRs for Section 66268.30. Waste Specific Prohibitions--Solvent Wastes; Section 66268.31. Waste Specific Prohibitions--Dioxin-Containing Wastes; Section 66268.32. Waste Specific Prohibitions--California List Wastes; Section 66268.33. Waste Specific Prohibitions--First Third Wastes; Section 66268.34. Waste Specific Prohibitions--Second Third Waste; and Section 66268.35. Waste Specific Prohibitions--Third Third Waste.
	22 CCR 66268.30	Applicable	If during excavation, treatment processes, or cleanup activities hazardous waste is identified through the proper characterization process, and will be managed in waste piles, the hazardous waste will be managed in accordance with the standards stated in these sections of the regulation.
	22 CCR 66268.31	Applicable	
	22 CCR 66268.32	Applicable	
	22 CCR 66268.33	Applicable	
	22 CCR 66268.34	Applicable	
	22 CCR 66268.35	Applicable	
California Hazardous Waste Control Law	Title 22, Division 4.5 (Environmental Health Standards for Management of Hazardous Waste), Chapter 18 (Land Disposal Restrictions), Article 4 (Treatment Standards)	Subsection(s) as Listed Below	These standards are applicable to sites where excavated materials are classified as hazardous waste and are disposed of or treated in an area not designated as a CAMU. Provides treatment standards expressed in contaminant concentrations in Section 66268.41. Treatment Standards Expressed As Concentrations in Waste Extract; Section 66268.42. Treatment Standards Expressed As Specified Technologies; and Section 66268.43. Treatment Standards Expressed As Waste Concentrations.
	22 CCR 66268.41	Applicable	These standards provide waste specific LDRs for solvent wastes, dioxin-containing wastes, and California Listed Wastes.
	22 CCR 66268.42	Applicable	If during excavation, treatment processes, or cleanup activities hazardous waste is identified through the proper characterization process, and will be managed in waste piles, the hazardous waste will be managed in accordance with the standards stated in these sections of the regulation.
	22 CCR 66268.43	Applicable	

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
California Hazardous Waste Control Law	Title 22, Division 4.5 (Environmental Health Standards for Management of Hazardous Waste), Chapter 18 (Land Disposal Restrictions), Article 5 (Prohibitions on Storage)	Subsection(s) as Listed Below	<p>This standard is applicable to sites where excavated material is classified as hazardous waste. The standard provides prohibitions on storage of restricted wastes.</p> <p>If during excavation, treatment processes, or cleanup activities hazardous waste is identified through the proper characterization process, and will be managed in waste piles, the hazardous waste will be managed in accordance with the standards stated in these sections of the regulation.</p>
	22 CCR 66268.50	Applicable	
State of California Air ARARs			
California Clean Air Act	SMAQMD, Rule 202, Section 301	Applicable	<p>This section of the rule requires the installation of BACT to a new emissions unit or modification of an existing emissions unit that will result in an emission of ROG, NOx, SOx, PM10, or CO.</p> <p>Best Available Control Technology for any emission unit is the most stringent of the following:</p> <p>The most effective emission control device, emission limit, or technique, singly or in combination, which has been required or used for the type of equipment comprising such an emissions unit unless the applicant demonstrates to the satisfaction of the SMAQMD that such limitations required on other sources have not been demonstrated to be achievable. For this type of process, a control efficiency (effluent/influent) of 95 percent is considered BACT.</p> <p>Top-down analysis process is the selection of any alternative basic equipment, fuel, process, emission control device, or technique, singly or in combination, determined to be technically feasible and cost-effective by the SMAQMD.</p> <p>In making a BACT determination for each affected pollutant the district may consider the overall effect on other affected pollutants.</p> <p>This regulation will apply to the treatment processes that release or cause to be released the pollutants listed in the regulation. The remedial alternatives utilizing air strippers, soil vapor extraction and ex situ bioremediation must ensure BACT is used to control emissions in excess of levels specified in the rule.</p>

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
California Clean Air Act	SMAQMD, Rule 202, Section 302	Applicable	<p>This section of the rule requires an applicant to provide offsets for any stationary source with the potential to emit any pollutant in excess of the levels shown below.</p> <p> ROG.....150 lbs/day NOx.....150 lbs/day SOx.....150 lbs/day PM10....80 lbs/day CO.....550 lbs/day </p> <p>Offsets for CO shall not be required if the applicant can demonstrate that ambient air quality standards will not be violated in the affected areas, and will not cause or contribute to a violation of the ambient air quality standard. All emissions increases in excess of the levels specified above need to be offset for the same calendar quarter.</p> <p>Emissions are determined by using actual stack test data, emission factors, engineering calculations, or other methods approved by the district in accordance with Section 411 of Rule 202.</p> <p>This regulation will apply to the treatment processes that release or cause to be released the pollutants listed in the regulation. The remedial alternatives utilizing air strippers, soil vapor extraction and ex situ bioremediation must ensure offsets are used for emissions in excess of levels specified in the rule.</p>
California Clean Air Act	SMAQMD, Rule 401	Applicable	<p>This rule prohibits the discharge of air contaminants which obscure visibility by more than 20 percent for a period of more than three minutes in any one hour.</p> <p>This regulation is applicable to any remedial action activity, which may cause a visible emission.</p>
California Clean Air Act	SMAQMD, Rule 402	Applicable	<p>This rule prohibits the discharge of air contaminants in quantities which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or which endangers the comfort, response, health, or safety of any such person or which causes or has natural tendency to cause injury or damage to business or property.</p> <p>This regulation is applicable to any remedial action activity, which may discharge air contaminants as defined by the rule.</p>
California Clean Air Act	SMAQMD, Rule 403	Applicable	<p>This rule requires a person to take every reasonable precaution not to cause or allow emissions of fugitive dusts from being airborne beyond the property line from which the emissions originated.</p> <p>This regulation is applicable to any remedial action activity, which may cause the release of fugitive dust.</p>
California Clean Air Act	SMAQMD, Rule 404	Applicable	<p>This rule prohibits the discharge of particulate matter from any source in excess of 0.1 grains per standard cubic foot.</p> <p>This regulation is applicable to any remedial action activity, which may cause the release of particulate matter.</p>

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
California Clean Air Act	SMAQMD, Rule 405	Applicable	<p>This rule controls the discharge of dust and condensed fumes into the atmosphere by establishing emission rates based on process weight.</p> <p>This regulation is applicable to any remedial action activity, which may cause the release of dust or condensed fumes.</p>
<i>State of California Groundwater and Soil ARARs</i>			
Federal Clean Water Act	40 CFR 122 - USEPA Administered Permit Programs: The National Discharge Elimination System	Subsections(s) as Listed Below	Requirements to ensure storm-water discharges from Mather AFB remedial action activities do not contribute to a violation of surface water quality standards.
	40 CFR 122.26	Applicable	
Federal Clean Water Act	40 CFR 122 - USEPA Administered Permit Programs: The National Discharge Elimination System	Subsections(s) as Listed Below	<p>All reasonable steps must be taken to minimize or prevent discharges which have a reasonable likelihood of causing adverse impacts on surface water quality (40 CFR 122.41(d)). All equipment and facilities must be properly operated and maintained, including adequate laboratory controls and appropriate quality assurance procedures (40 CFR 122.41(e)). Discharges into surface water must achieve federal and state water quality standards (40 CFR 122.44(d)).</p> <p>These sections of the regulation governing impacts to water quality apply to the groundwater during/after treatment at the Main/SAC and Site 7 groundwater plumes.</p>
	40 CFR 122.41(d)	Applicable	
	40 CFR 122.41(e)	Applicable	
	40 CFR 122.44 (d)	Applicable	
	State Water Resources Board Order 92-08-DWQ	Applicable	<p>Must identify the sources of sediment and other pollutants that affect the quality of storm-water discharges and implement practices to reduce these discharges.</p> <p>Storm-water discharges from construction sites must meet pollutant limits and standards. The narrative effluent standard includes the requirements to implement BMPs and/or appropriate pollution prevention control practices.</p> <p>Inspections of the construction site prior to anticipated storm events and after actual storm events need to be conducted to identify areas contributing to storm-water discharge and evaluated for the effectiveness of BMPs and other control practices.</p> <p>Applies to construction sites five acres or greater in size. It also applies to smaller sites that are part of a larger common plan of development or sale.</p> <p>The remedial actions at the groundwater sites are being conducted as part of the overall remedial actions for Mather AFB. Excavation, grubbing, clearing, and other activities may be required for installation of a groundwater extraction and treatment system.</p>

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
	State Water Resources Board Order 92-13-DWQ (as amended by Order number 92-12-DWQ)	Applicable	<p>Storm-water discharges must meet the narrative standard of the permit, this standard includes implementing BMPs and prohibits the discharge of non-storm-water. Discharges should identify the sources of pollutants to the storm-water. BMPs for these sources can include treatment of storm-water discharge and source reduction. Non-storm-water sources of pollutants include improper dumping, spills, and leaks.</p> <p>Monitoring must be conducted to demonstrate compliance and measure the effectiveness of BMPs. Monitoring includes performing visual inspections during the dry and wet seasons, conducting annual inspections, and sampling and analysis for specific analytical parameters.</p> <p>Applies to landfills, land application sites, and disposal sites (Site 7) that have received industrial wastes, and other industrial areas.</p>
Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13140, 13240)	CVR Basin Plan	Applicable	<p>Establishes water quality objectives, including narrative and numerical standards, that protect the beneficial uses of surface and groundwater in the region. The designated beneficial uses are municipal and domestic; agricultural; and industrial supply.</p> <p>Specific applicable portions of the Basin Plan include beneficial uses of affected water bodies and water quality objectives to protect those uses.</p>
Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13140, 13240)	SWRCB Resolution 68-16	Applicable	<p>The resolution establish requirements for activities involving discharges of contamination directly into surface waters or groundwater (e.g. quality of pump and treat effluent into surface waters or groundwater).</p> <p>Substantive requirements established by the resolution include use of "best practicable treatment or control" for discharging the effluent.</p> <p>This regulation applies to remedial action activities that cause active discharges to surface waters or groundwater.</p>
Porter-Cologne Water Quality Control Act (California Water Code Sections 13000, 13140, 13240)	SWRCB Resolution 88-63	Applicable	<p>Specifies that, with certain exceptions, all ground and surface waters have the beneficial use of municipal or domestic water supply. Applies in determining beneficial uses for waters that may be affected by discharges of waste.</p> <p>SWRCB Resolution 88-63 applies to all sites that may be affected by discharges of waste to groundwater or surface water. The resolution specifies that, with certain exceptions, all groundwater and surface waters have beneficial use of municipal or domestic water supply. Consequently, California State primary MCLs are relevant and appropriate, however the most stringent federal or state standard will be the ARAR for the remedial action. California standards which may be ARARs for the site(s) are found in 22 CCR 66435, 22 CCR 64444.5, and 22 CCR 64473.</p>

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140, 13240, 13260, 13263, 13267, 13300, 13304, 13307)	SWRCB Resolution 92-49 (as amended April 21, 1994) Subparagraph IIIG	Relevant and Appropriate	<p>Section IIIG directs the Water Boards to ensure dischargers clean up and abate the "effects" of discharges in a manner promoting attainment of either background water quality or the best reasonable water quality if background quality is not feasible (feasibility determined by factors listed in Section IIIG and 23 CCR Chapter 15, Section 2550.4). Minimum water standards must be protective of beneficial use.</p> <p>Section IIIG directs the Water Board to apply 23 CCR Chapter 15, Section 2550.4 in approving any alternative cleanup levels less stringent than background quality and to apply 23 CCR Chapter 16, Section 2725 for alternatives cleanup levels for remediation of releases from USTs.</p> <p>The requirement to obtain the Water Board's approval is not an ARAR; however, the Air Force will consult with the Water Board and USEPA in applying the State's criteria to establish alternative cleanup levels.</p> <p>Subject to the limitations described above, this requirement is relevant and appropriate for establishing levels for effects to surface and groundwater quality caused by releases of contaminants.</p>
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304)	Title 23 (Waters), Division 3 (State Water Resources Control Board), Chapter 15 (Discharges of Waste to Land), Article 1 (General)	Subsection(s) as Listed Below	<p>23 CCR 2510(g) states persons responsible for discharges at waste management units which are closed, abandoned, or inactive on the effective date of these regulations may be required to develop and implement a monitoring program in accordance with Article 5 of this Chapter. If water quality impairment is found, such persons may be required to develop and implement a corrective action program based on the provisions of this subchapter.</p> <p>23 CCR 2511 (d) states actions taken by or at the direction of public agencies to cleanup or abate conditions of pollution or nuisance resulting from unintentional or unauthorized releases of waste or pollutants to the environment; provided that wastes, pollutants, or contaminated materials removed from the immediate place of release shall be discharged according to Article 2 of this Chapter; and further provided that remedial actions intended to contain such wastes at the place of release shall implement applicable provisions of this subchapter to the extent feasible.</p> <p>This regulation applies² to waste management units located at Sites 7, 56, 57, 59, 60, 62, 65, and 69.</p>
	23 CCR 2510(g) ¹	Relevant and Appropriate	
	23 CCR 2511(d)	Applicable or Relevant and Appropriate ²	

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304)	Title 23 (Waters), Division 3 (State Water Resources Control Board), Chapter 15 (Discharges of Waste to Land), Article 2 (Waste Classification and Management)	Applicable or Relevant and Appropriate ^{3,4} (See Sections Listed Below)	<p>Waste Classification: Wastes must be classified as either: hazardous waste (23 CCR 2521), designated waste (23 CCR 2522), nonhazardous solid waste (23 CCR 2523), or inert waste (23 CCR 2524). A hazardous waste can only be discharged to a Class I facility (unless a variance is applicable under Title 22 regulations). A designated waste can be discharged to a Class I or Class II facility. A nonhazardous solid waste can be discharged to a Class I, II, or III facility. Inert wastes do not need to be sent to a classified facility.</p> <p>Some of the sites have alternatives that involve excavation of the contaminated soil. At the conclusion of on-base treatment, the soils are proposed for use in the foundation layer of the landfill cap at Site 4. It is expected based on engineering judgement that most of the sites excavated will yield designated and not yield hazardous waste. However, until sampling is performed on the material at time of excavation, a final determination cannot be made. The excavated waste must be discharged to the appropriate facility pursuant to Article 2.</p>
	23 CCR 2520(a)	Applicable to Site 7	Requires that wastes identified as hazardous, designated, or nonhazardous solid waste (sections 2521, 2522 and 2523 of Article 2) be allowed only at waste management units which have been approved and classified.
	23 CCR 2520(b)	Applicable to Site 7	Prohibits the discharge of wastes which have the potential to reduce or impair the integrity of containment structures or which, if commingled with other wastes in the unit, could produce violent reaction, heat or pressure, fire or explosion, toxic by-products, or reaction products which in turn: <ul style="list-style-type: none"> a. require a higher level of containment than provided by the unit; b. are restricted 'hazardous wastes'; or c. impair the integrity of containment structures.
	23 CCR 2520(c)	Applicable to Site 7	Requires accurate characterization of waste.
	23 CCR 2520(d)	Applicable to Site 7	Requires management of liquids at classified waste management units.

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304)	Title 23 (Waters), Division 3 (State Water Resources Control Board), Chapter 15 (Discharges of Waste to Land), Article 3 (Waste Management Unit Classification and Siting)	Subsection(s) as Listed Below	Classification and Siting Criteria (23 CCR 2530(c & d)): New waste piles shall be designed, constructed, and operated to ensure that wastes will be a minimum of five feet above the highest groundwater elevation. All containment structures at the unit shall have a foundation or base capable of supporting the structures and capable of withstanding hydraulic pressure gradients.
	23 CCR 2530(c)	Applicable ^{4,5}	Class II (23 CCR 2532): Waste Management Units for Designated Waste: Waste management units will be isolated from the waters of the state through either natural or engineered barriers. The unit needs to be able to withstand flooding without washout, ground rupture, and rapid geological change.
	23 CCR 2530 (d)	Applicable ^{4,5}	Relevant to the ex situ bioremediation alternatives. Excavated wastes from various sites will be spread in lifts in a bioremediation cell. Treatment might include nutrient addition, irrigation, and aeration. This treatment is considered similar to a waste pile.
	23 CCR 2532	Applicable ^{4,5}	Soils containing petroleum hydrocarbons are not anticipated to be classified as hazardous, but may be classified as designated wastes. Thus Class II requirements are considered most relevant.
	23 CCR 2533(c)	Relevant and Appropriate to Site 7	Requires that landfills be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return period.
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304)	Title 23 (Waters), Division 3 (State Water Resources Control Board), Chapter 15 (Discharges of Waste to Land), Article 4 (Construction Standards)	Subsection(s) as Listed Below ³	
	23 CCR 2541(c)	Relevant and Appropriate to Site 7	Requires hydraulic conductivities determined through laboratory methods be confirmed by appropriate field testing.
	23 CCR 2541(d)	Applicable to Site 7	Requires earthen materials used in containment structures consist of a mixture of clay and other suitable fine-grained soils which have specified characteristics, and which can be compacted to attain the required permeability when installed.
	23 CCR 2546(a) & 2546(c) to (f)	Applicable to Site 7	Requires management of precipitation and drainage control.

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304)	Title 23 (Waters), Division 3 (State Water Resources Control Board), Chapter 15 (Discharges of Waste to Land), Article 5 (Water Quality Monitoring and Response Programs for Waste Management Units)	Subsection(s) as Listed Below ³	These provisions of Chapter 15 address remediation of contamination at waste management units and monitoring of groundwater quality during the remedial action. The corrective action program requires that the cleanup objectives be met at the designated monitoring points and that they be met throughout the zone that is affected. Further, demonstration of the effectiveness of the remediation requires showing the concentrations at each monitoring point are at or below the cleanup levels for one year following completion of the corrective action(s). The evaluation monitoring program provides further substantive requirements regarding the designation of monitoring parameters and monitoring frequency.
	23 CCR 2550.1	Relevant and Appropriate	Section 23 CCR Part 2550.1 describes the three types of groundwater monitoring programs; detection, statistical evaluation, and physical evaluation monitoring. Section 23 CCR Part 2550.10 (Corrective Action Program) requires that a groundwater monitoring program be implemented in conjunction with a corrective action to demonstrate the effectiveness of the remedial technologies. Both monitoring programs must meet the requirements outlined in Section 2550.7 which state: -there is a sufficient number of monitoring points, including background points; and -the monitoring points should be located at appropriate locations and screened in the zones of concern.
	23 CCR 2550.4	Relevant and Appropriate ⁶	
	23 CCR 2550.6	Relevant and Appropriate	Cleanup levels must be set at background concentration levels or, if background levels are not technologically and economically feasible, then at the lowest levels that are economically and technologically feasible. Specific factors must be considered in setting cleanup levels above background levels. Cleanup levels above background levels shall be evaluated every five years. If the actual concentration of a constituent is lower than its associated cleanup level, the cleanup level shall be lowered to reflect existing water quality (23 CCR 2550.4). It has been determined that cleanup to background is not economically feasible and therefore not relevant and appropriate to aquifer cleanup standards.
	23 CCR 2550.7	Relevant and Appropriate	Requires monitoring for compliance with remedial action objectives for three years from the date of achieving cleanup levels (23 CCR 2550.6).
	23 CCR 2550.9	Relevant and Appropriate	Requires general soil, surface water, and groundwater monitoring (23 CCR 2550.7) Requires an assessment of the nature and extent of the release, including a determination of the spatial distribution and concentration of each constituent (23 CCR 2550.9).
	23 CCR 2550.10	Relevant and Appropriate	Requires implementation of corrective action measures that ensure that cleanup levels are achieved throughout the zone affected by the release by removing the waste constituents or treating them in place. Source control may be required. Also requires monitoring to determine the effectiveness of corrective actions. To demonstrate cleanup, the concentration of each COC in the groundwater must be equal to, or less than, the cleanup goal for at least one year following suspension of the corrective action (23 CCR 2550.10).

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304)	Title 23 (Waters), Division 3 (State Water Resources Control Board), Chapter 15 (Discharges of Waste to Land), Article 8 (Closure and Post-Closure Maintenance)	Subsections as Listed Below ³	<p>General Closure Requirements: partial or final closure of classified waste management units must include continued maintenance of waste containment, precipitation, drainage controls, and groundwater monitoring throughout the closure and post-closure periods (23 CCR 2580(a)). At least two permanent monuments must be installed to allow the elevations of wastes, containment structures, and monitoring facilities to be determined (23 CCR 2580(d)). Vegetation cover for a closed waste management unit shall require minimum irrigation and maintenance, and shall not impair the integrity of any containment structure (23 CCR 2580(e)).</p> <p>The post-closure maintenance period will extend as long as wastes pose a threat to water quality.</p> <p>This regulation applies to Site 7.</p>
	23 CCR 2580(a)	Applicable	
	23 CCR 2580(d)	Relevant and Appropriate	
	23 CCR 2580(e)	Relevant and Appropriate	
	23 CCR 2581	Applicable to Site 7	Requires a final cover constructed in accordance with specific prescriptive standards, to be maintained as long as wastes pose a threat to water quality.
Porter-Cologne Water Quality Control Act (California Water Code Sections 13140-13147, 13172, 13260, 13263, 13267, 13304)	Title 23 (Waters), Division 3 (State Water Resources Control Board), Chapter 15 (Discharges of Waste to Land), Article 9 (Compliance Procedures)	Subsections as Listed Below ³	Regulation applies to closing solid waste disposal sites.
	23 CCR 2596(b)	Applicable to Site 7	Procedures related to routine operations and emergency conditions must be developed for the waste disposal activities.
	23 CCR 2597	Applicable to Site 7	Procedures for closure and post-closure maintenance must be developed. The magnitude of settlement due to waste decomposition and compaction and subsidence of the underlying natural geologic materials must be estimated. If the post-closure use is not non-irrigated open space, the water balance for the site must be estimated and adverse impacts on the final cover anticipated.
State of California Solid Waste ARARs			
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	Title 14 (Natural Resources), Division 7 (California Integrated Waste Management Board), Chapter 3 (Minimum Standards for Solid Waste Handling and Disposal), Article 7.3 (Disposal Site Records)	Subsections as Listed Below	This regulation is applicable to solid waste disposal sites as defined by Public Resources Code Section 40122, i.e. for waste consolidation at Site 7.
	14 CCR 17636	Applicable	Weight/Volume Records: the weight or volume of waste accepted must be determined to an accuracy of $\pm 10\%$
	14 CCR 17637	Applicable	Subsurface Records: the length and depth of any cut(s) made in natural terrain where fill will be placed and the depth to groundwater must be determined and documented.

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	Title 14 (Natural Resources), Division 7 (California Integrated Waste Management Board), Chapter 3 (Minimum Standards for Solid Waste Handling and Disposal), Article 7.4 (Disposal Site Improvements)	Subsections as Listed Below	This regulation is applicable to solid waste disposal sites as defined by Public Resources Code Section 40122 i.e. for waste consolidation at Site 7
	14 CCR 17658	Applicable	Site Security the perimeter of the landfill must be secured either through barriers or topographic constraints to discourage unauthorized entry
	14 CCR 17659	Applicable	Access Roads landfill roads must be reasonably smooth to minimize dust and tracking of materials onto public roads
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	Title 14 (Natural Resources), Division 7 (California Integrated Waste Management Board), Chapter 3 (Minimum Standards for Solid Waste Handling and Disposal), Article 7.5 (Disposal Site Operations)	Subsections as Listed Below	This regulation is applicable to solid waste disposal sites as defined by Public Resources Code Section 40122 i.e. for waste consolidation at Site 7
	14 CCR 17676	Applicable	Confined Unloading Requires limiting unloading area, controlling windblown materials, and deposition at toe of fill
	14 CCR 17677	Applicable	Spreading and Compacting Requires spreading and compacting of refuse in layers
	14 CCR 17678	Applicable	Slopes and Cuts The slope of the working face shall be maintained at a ratio which will allow effective compaction of the wastes The depth of cuts and slopes of trench sides shall not exceed specified horizontal to vertical ratios
	14 CCR 17680	Applicable	Stockpiling Requires stockpiled cover material and unacceptable native materials to be placed so as not to cause problems or interference with site operations
	14 CCR 17684	Applicable	Intermediate Cover Requires cover on fill where no additional refuse will be deposited within 180 days
	14 CCR 17686	Applicable	Scavenging Scavenging is prohibited
	14 CCR 17687	Applicable	Salvaging Permitted Salvaging is permitted in a planned and controlled manner
	14 CCR 17688	Applicable	Volume Reduction and Energy Recovery Volume reduction and energy recovery are permitted in planned and controlled manners
	14 CCR 17689	Applicable	Processing Area Processing area shall be confined to greatest degree practicable
	14 CCR 17690	Applicable	Storage of Salvage Salvage material must be safely isolated for storage
	14 CCR 17691	Applicable	Removal Storage time for salvage materials shall be limited to a safe duration
	14 CCR 17692	Applicable	Non-Salvageable Items Items capable of impairing public health shall not be salvaged without approval by Enforcement Agency and local health entity

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
California Integrated Waste Management Act of 1989 PRC 40502, 43020, 43021 and 43030	Title 14 (Natural Resources), Division 7 (California IWMB), Chapter 3 (Minimum Standards for Solid Waste Handling and Disposal), Article 7.6 (Disposal Site Controls)	Subsections as Listed Below	This regulation is applicable to solid waste disposal sites as defined by Public Resources Code Section 40122, i.e. for waste consolidation at Site 7.
	14 CCR 17701	Applicable	Nuisance Control: Each site shall be operated and maintained so as not to create a public nuisance.
	14 CCR 17704	Applicable	Leachate Control: The operator shall take adequate steps to monitor, collect, treat, and effectively dispose of leachates.
	14 CCR 17705	Applicable	Gas Control: Landfill gas control may be required based on the monitoring results.
	14 CCR 17706	Applicable	Dust Control: The operator shall take adequate measures to minimize the creation of dust.
	14 CCR 17707	Applicable	Vector and Bird Control: The operator shall control or prevent the propagation, harborage, or attraction of flies, rodents, or other vectors, and to minimize bird problems.
	14 CCR 17708	Applicable	Drainage And Erosion Control: Adequate drainage shall be provided. Effects of erosion shall be promptly repaired and steps taken to prevent further occurrence.
	14 CCR 17709	Applicable	Contact with Water: No solid waste shall be deposited in direct contact with surface water.
	14 CCR 17710	Applicable	Grading of Fill Surface: Covered surfaces of the disposal area shall be graded to promote run-off and prevent ponding, accounting for future settlement
	14 CCR 17711	Applicable	Litter Control: Litter and loose materials shall be routinely collected and disposed of properly.
	14 CCR 17713	Applicable	Odor Control: The disposal site shall not be a source of odor nuisances.
	14 CCR 17741	Applicable	Burning Wastes: Burning wastes shall be extinguished.

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
California Integrated Waste Management Act of 1989 Public Resources Code Sections 40502 and 43020	Title 14 (Natural Resources), Division 7 (California Integrated Waste Management Board), Chapter 3 (Minimum Standards for Solid Waste Handling and Disposal), Article 7.8 (Disposal Site Closure and Post-Closure Maintenance)	Subsection(s) as Listed Below	The regulation is applicable to solid waste sites that closed after August 1988. Although never classified as a landfill under California regulations, Site 7 was used for the disposal of POL and other industrial wastes. The wastes discarded at Site 7 are likely to be classified as designated wastes using the criteria in effect in 1994 (23 CCR 2520-2523). Because of the similarity of historical activities and site conditions at Site 7 to a landfill, Article 7.8 regulations are considered relevant and appropriate.
	14 CCR 17766	Relevant and Appropriate	ERP: Potential emergency conditions that may exceed the design of the site and could endanger the public health or environment must be anticipated. Procedures for mitigation of these conditions should be developed (14 CCR 17766).
	14 CCR 17767	Relevant and Appropriate	Security at Closed Sites: All points of access to the site must be restricted, except permitted entry points. All monitoring, control, and recovery systems shall be protected from unauthorized access (14 CCR 17767).
	14 CCR 17773(b)	Relevant and Appropriate	Final Cover: The design and construction of the final cover must meet specific prescriptive standards (references 23 CCR 2581(a)). These include minimum thickness and quality of the construction material (14 CCR 17773 (b) and (e)). If the prescriptive standards are not feasible, engineered alternatives can be approved provided that they are consistent with the performance goals and afford equivalent protection against water quality impact (14 CCR 17773 (b, c, d, e)).
	14 CCR 17773(c)	Relevant and Appropriate	
	14 CCR 17773(d)	Relevant and Appropriate	
	14 CCR 17773(e)	Relevant and Appropriate	

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
California Integrated Waste Management Act of 1989 Public Resources Code Sections 40502 and 43020	14 CCR 17774(a)	Relevant and Appropriate	CQA: A CQA program must be designed and implemented. It must include specific parameters (and for some components specific testing methods) for each component of the final cover (14 CCR 17774(a, c - h)).
	14 CCR 17774(c)	Relevant and Appropriate	
	14 CCR 17774(d)	Relevant and Appropriate	
	14 CCR 17774(e)	Relevant and Appropriate	
	14 CCR 17774 (f)	Relevant and Appropriate	
	14 CCR 17774(g)	Relevant and Appropriate	
	14 CCR 17774(h)	Relevant and Appropriate	
	14 CCR 17776(a)	Relevant and Appropriate	Final Grading: The final grades for the covered landfill must meet grading standards provided in 23 CCR 2581(b), they must be appropriate to control runoff and erosion. Two monuments must be installed to assess changes in the grade pursuant to 23 CCR 2581(d) (14 CCR 17776(a, c, e, f)).
	14 CCR 17776(c)	Relevant and Appropriate	
	14 CCR 17776(e)	Relevant and Appropriate	
	14 CCR 17776(f)	Relevant and Appropriate	
	14 CCR 17777(a)	Relevant and Appropriate	Final Site Face: The design of the final site face must provide for the integrity of the final cover under both static and dynamic conditions. The design of the final face must achieve a safety factor of 1.5 under dynamic conditions. This evaluation must consider the critical slope, the engineering properties of the foundation materials, refuse, and other layers making up the site, the maximum expected horizontal acceleration in rock, and other seismic shaking parameters (14 CCR 17777(a, b, c[portions])).
	14 CCR 17777(b)	Relevant and Appropriate	
	14 CCR 17777(c)[portions]	Relevant and Appropriate	

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
	14 CCR 17778(a)	Relevant and Appropriate	Final Drainage: The design of the final cover must control runoff and runoff produced by a 100-year, 24-hour storm event and must be prepared according to CQA requirements. The runoff and runoff control systems must be designed and constructed in accordance with 23 CCR 2546(c) and (d). The runoff collection and holding facilities must perform pursuant to requirements in 23 CCR 2546(d) (14 CCR 17778(a, c -j)).
	14 CCR 17778(c)	Relevant and Appropriate	
	14 CCR 17778(d)	Relevant and Appropriate	
	14 CCR 17778(e)	Relevant and Appropriate	
	14 CCR 17778(f)	Relevant and Appropriate	
	14 CCR 17778(g)	Relevant and Appropriate	
	14 CCR 17778(h)	Relevant and Appropriate	
	14 CCR 17778(i)	Relevant and Appropriate	
	14 CCR 17778(j)	Relevant and Appropriate	
	14 CCR 17779	Relevant and Appropriate	Slope Protection and Erosion Control: The design and construction of the slopes must protect the integrity of the final cover and minimize soil erosion (14 CCR 17779).
	14 CCR 17781	Relevant and Appropriate	Leachate Control During Closure and Post-Closure: Leachate must be monitored, collected, treated, and discarded appropriately. The state does not intend that subsurface leachate monitoring and collection systems need to be added to existing landfills unless leachate production and/or accumulation is evident (14 CCR 17781).
	14 CCR 17783	Relevant and Appropriate	Gas Monitoring and Control During Closure and Post-Closure: Landfill gases must be collected and analyzed; the concentration of combustible gas at the landfill boundary must be five percent or less, and trace gases must not be at levels that cause adverse health or environmental impacts. Monitoring should be conducted for 30 years or until authorized to be discontinued by showing that methane is no longer produced. Methane was not detected in the landfill gas survey conducted in 1988. Measurable (ppb to ppm) levels of benzene and chlorinated hydrocarbons were found in the soil gas (14 CCR 17783).
	14 CCR 17788	Relevant and Appropriate	Post-Closure Maintenance: The landfill must be maintained and monitored for no less than 30 years following closure. Monitoring would continue for 30 years following closure unless it can be demonstrated that the landfill does not pose a threat to public health and safety or to the environment. If the threat has been eliminated, post-closure maintenance can be discontinued (14 CCR 17788).

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
	14 CCR 17796(c)	Relevant and Appropriate	<p>Post-Closure Land Use: Site closure design shall show one or more proposed uses of the closed site or show development that is compatible with open space (14 CCR 17796(c, d, f)).</p> <p>Construction improvements will be compatible with closure and post-closure requirements and any new activities must not increase the potential threat to public health and safety.</p>
	14 CCR 17796(d)	Relevant and Appropriate	
	14 CCR 17796(f)	Relevant and Appropriate	
	14 CCR 17796(c)	Relevant and Appropriate	<p>Post-Closure Land Use: Site closure design shall show one or more proposed uses of the closed site or show development that is compatible with open space (14 CCR 17796(c, d, f)).</p> <p>Construction improvements will be compatible with closure and post-closure requirements and any new activities must not increase the potential threat to public health and safety.</p>
	14 CCR 17796(d)	Relevant and Appropriate	
	14 CCR 17796(f)	Relevant and Appropriate	
California Integrated Waste Management Act of 1989 Public Resources Code Sections 40502 and 43509	Title 14 (Natural Resources), Division 7 (California Integrated Waste Management Board), Chapter 5 (Enforcement of Solid Waste Standards and Administration of Solid Waste Facilities Permits; Loan Guarantees), Article 3.2 (Reports of Facility Information)	Subsection(s) as Listed Below	Provides the minimum standards for closure of a solid waste disposal site (Section 18262.3. Contents of the Final Closure Plan and Section 18265.3. Contents of the Final Post-Closure Maintenance Plan). Applies to solid waste disposal sites that received waste after January 1, 1988.
	14 CCR 18222	Relevant and Appropriate	Report of Disposal Site Information: The planning and procedural requirements necessary to ensure that solid waste is handled and disposed in manners that protect public health and safety and the environment must be conducted.
California Integrated Waste Management Act of 1989 Public Resources Code Sections 40502 and 43509	Title 14 (Natural Resources), Division 7 (California Integrated Waste Management Board), Chapter 5 (Enforcement of Solid Waste Standards and Administration of Solid Waste Facilities Permits; Loan Guarantees), Article 3.4 (Application and Approval of Closure and Post-Closure Maintenance Plans)	Subsection(s) as Listed Below	Provides the minimum standards for closure of a solid waste disposal site (Section 18262.3. Contents of the Final Closure Plan and Section 18265.3. Contents of the Final Post-Closure Maintenance Plan). Applies to solid waste disposal sites that received waste after January 1, 1988.
	14 CCR 18262.3	Relevant and Appropriate	
	14 CCR 18265.3	Relevant and Appropriate	

Table 6-6. Action-Specific ARARs (continued)

Source	Standard, Requirement, Criterion, or Limitation	ARAR Status	Description of Applicable or Relevant and Appropriate Requirements
<i>Other State of California ARARs</i>			
40 CFR 122.26	Fish and Game Code	Subsection(s) as Listed Below	It is unlawful to deposit in, permit to pass into, or place where it can pass into the waters of this state any material listed in Fish and Game Code Sections 5650 and 5652.
	Sections 5650	Relevant and Appropriate	
	Section 5652	Relevant and Appropriate	

CCR = California Code of Regulation

ERP = Emergency Response Plan

ROG = reactive organic gas

CO = carbon monoxide

CFR = Code of Federal Regulation

RCRA = Resource Conservation and Recovery Act

AFB = Air Force Base

CAMU = Corrective Action Management Unit

USEPA = United States Environmental Protection Agency

HWCL = Hazardous Waste Control Law

POL = petroleum, oil, and lubricant

NOx = nitrogen oxide

CVR = Central Valley Region

MCL = maximum contaminant level

ARAR = applicable or relevant and appropriate requirement

DWQ = Department of Water Quality

SMAQMD = Sacramento Metropolitan Air Quality Management District

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

BMP = Best Management Practice

UST = underground storage tanks

SOx = sulfur oxide

ppm = parts per million

COC = contaminant of concern SAC = Strategic Air Command

CQA = Construction Quality Assurance

LDR = land disposal restrictions

PM10 = particulate matter

ppb = parts per billion

BACT = Best Available Control Technology

SWRCB = State Water Resource Control Board

1. Only as invoked through 23 CCR 2511(d) for action intended to contain waste in place.

2. 23 CCR 2511(d) is applicable to waste management units in operation after November 27, 1984, and relevant and appropriate for units whose operations ceased prior to November 27, 1984.

3. Only as invoked by 23 CCR 2511(d).

4. The regulation is applicable to waste removed from waste management units and relevant and appropriate for waste removed from other sites/units.

5. Only as invoked through 23 CCR 2511(d) and 23 CCR 2520(a)(2).

6. Only as invoked by 92-49 IIIG.

The following chapters of Title 22, Division 4.5 Environmental Health Standards for Management of Hazardous Waste, have been identified as ARARs for remedial action sites at Mather AFB: Chapter 12 - Standards Applicable to Generators of Hazardous Waste, Article 1 - Applicability; Chapter 14 - Standards for Owners and Operators of Hazardous Waste Transfer, Treatment, Storage, and Disposal Facilities; Article 6 - Water Quality Monitoring and Response Programs for Permitted Facilities; Article 7 - Closure and Post Closure; Article 9 - Use and Management of Containers; Article 12 - Waste Piles; Article 19 - Corrective Action for Waste Management Units; Chapter 18 - Land Disposal Restrictions, Article 1 - General; Article 3 - Prohibitions on Land Disposal; Article 4 - Treatment Standards; and Article 5 - Prohibitions on Storage.

6.3.1.1 *Other Federal Regulations*

The TSCA delineates the requirements for excavation of PCBs and sampling activities associated with PCB removal through 40 CFR Part 761. These requirements are TBCs for the excavation and removal of PCB contaminated soils. This guidance is used to establish minimum depths and area for cleanup as outlined in the regulation. Site 15 is the only site where PCBs are COCs, and the material is below the 50 ppm level specified in the regulation. The identified alternative will excavate the material and dispose of it at Site 4 or Site 7, as appropriate, as foundation material for a landfill cap.

6.3.2 *State ARARs and TBCs*

The following California statutes, laws, and regulations have been identified as ARARs and TBCs. The following subsections list the ARARs and TBCs in the following order: air, water, waste, and other state regulations. The state action-specific ARARs are listed in Table 6-6, TBCs are listed in the text under other regulations and a brief description of the source of the ARARs are listed along with the regulations derived under the source. Also presented is the USAF position on substantive requirements of these ARARs and how they apply to the selected remedial actions.

6.3.2.1 *State Air ARARs*

The California Clean Air Act, under the Federal Clean Air Act and 1990 Amendments, authorizes the State of California to develop a State Implementation Plan (SIP) to enforce clean air regulations and laws. The SIP, developed through state legislation, divided the state into local air control districts and allowed each district to enforce the requirements of the federal and state Clean Air Acts. Mather AFB is located in the Sacramento Metropolitan Air Quality Management District (SMAQMD); state air regulations are the most stringent

ARARs. The SMAQMD applicable regulations are: Rule 202, Section 301 - Best Available Control Technology; Section 302 - Offsets; Rule 401 - Visible Emissions; Rule 402 - Nuisance; Rule 403 - Fugitive Dust; Rule 404 - Particular Matter; and Rule 405 - Dust and Condensed Fumes. Table 6-6 contains the applicable or relevant and appropriate sections of these regulations identifying the ARAR status and a brief description of the substantive requirements and applicability to either the site, remedial action, or technology used to cleanup the site and contaminated material.

6.3.2.2 State Groundwater and Soil ARARs

The Federal Clean Water Act regulates discharge to surface waters and groundwater. Under this statute is the 40 CFR 122 - USEPA Administrative Permit Program: National Discharge Elimination System regulation for stormwater and other discharges to surface waters. This program is delegated to the state under the statute and therefore is considered a state ARAR.

The SWRCB has issued two general orders under the federal statute, Clean Water Act, that provides the substantive requirements for stormwater management at industrial sites (SWRCB Order 92-13-DWQ) and construction sites (SWRCB Order 92-08-DWQ). The substantive requirements for industrial sites are meeting the narrative water quality standards, implementing best management practices, identifying and monitoring sources of stormwater pollutants, and *eliminating non-stormwater* sources of pollutants. The substantive requirements associated with construction activities such as excavation and grading include application of engineering measures and best management practices to control stormwater runoff.

The Porter-Cologne Water Quality Control Act is one of the statutory bases for regulation of discharges of waste to land that could impair either surface water or groundwater quality in California. It establishes the authority of the SWRCB and the CVRWQCB to protect the quality of surface water and groundwater. The California Water Code sections used as a source for action-specific ARARs and TBCs are presented in Table 6-6 along with the associated regulatory citations. Under the Porter-Cologne Act the following regulations or resolutions regulating and protecting the waters of the state are considered relevant and appropriate and are therefore ARARs: Central Valley Region (CVR) Basin Plan; SWRCB Resolution 68-16; SWRCB Resolution 88-63; and SWRCB Resolution 92-49; California Title 23, Chapter 3, SWRCB, Subchapter 15 - Discharges of Waste to Land, Article 1 - General; Article 2 - Waste Classification and Management; Article 3 - Waste Management Unit Classification and Siting; Article 5 - Water Quality Monitoring and Response Programs

for Waste Management Units; Article 8 - Closure and Post-Closure Maintenance; and Article 9 - Compliance Procedures. Table 6-6 contains the applicable or relevant and appropriate sections of these regulations identifying the ARAR status and a brief description of the substantive requirements and applicability to either the site, remedial action, or technology used to clean up the site and contaminated material.

State Water Resources Control Board Resolution 68-16 has been identified as an applicable requirement for the protection of surface waters and groundwater of the state. The USAF and the state do not agree on the full substantive requirements of this resolution and the impacts on the remedial action activities need to cleanup Mather AFB. The USAF disagrees with the state's contention that the narrative language establishes chemical-specific ARARs for both soils and groundwater, and that discharges subject to the resolution include post-1968 migration of in situ contamination from the vadose zone to groundwater. The USAF believes that discharges only encompass remedial activities that actively discharge to surface water and groundwater of the state.

According to the decision of the USEPA Administrator, SWRCB Resolution 68-16, the water anti-degradation policy, is a state ARAR for the establishment of numerical limits for the reinjection of treated groundwater into clean areas (i.e., high quality waters) of the aquifer, (i.e., outside of the contaminated plume). The numerical limits established on a monthly median and on a daily maximum basis to meet the requirements of SWRCB Resolution 68-16 are set forth in Table 6-7. With respect to the injection of treated groundwater within the contaminated plume, treatment shall be such that the concentration level of the contaminant in the groundwater must not exceed the concentration in the groundwater at the point of injection measured on a monthly median basis and also not exceed the federal and state ARAR. With respect to injection of treated groundwater outside the contaminated plume, the effluent is required to meet daily and 30-day median concentrations for each COC as shown in Table 6-7. To meet the requirement that the selected remedy be protective of human health and the environment, the USAF shall maintain hydraulic control of the plume while extracting contaminated groundwater, and reinjecting treated groundwater into the contaminant plume or the clean portion of the aquifer.

Table 6-7. Groundwater Discharge Treatment Standards

Constituent	Standard for Injection into Noncontaminated Portions of the Aquifer Based on State Board Resolution 68-16 ($\mu\text{g/l}$)		Standards for Injection in the Contaminated Portions of the Aquifer Based on the more Stringent of (a)MCL's (State or Federal) whichever is more stringent or (b)In Situ Groundwater Concentrations at the Point of Injection as 30 Day Median ($\mu\text{g/l}$)	
	30 Day Median	Daily Maximum	Class of Carcinogens	State or Federal MCLs Daily Maximum
Main Base/SAC Ind. Plume				
Benzene	0.5	0.5 (1)	A	1.0 (CA-MCL)
CCl ₄	0.5	0.5 (2)	B2	0.5 (CA-MCL PQL)
Chloromethane	0.5	3.0	C	3.0 (SNARL)
1,2-DCA	0.5	0.5 (3)	B2	0.5 (CA-MCL PQL)
1,1-DCE	0.5	6.0	C	6.0 (CA-MCL)
Cis-1,2 - DCE	0.5	6.0	D	6.0 (CA-MCL)
Lead	Background	15.0	-	15.0 (FMCL)
PCE	0.5	0.7 (4)	B2	5.0 (FMCL)
TPH-G	50.0	50.0	-	50.0 (PQL)
TPH-D	50.0	100.0	-	100.0 (US EPA HA)
TCE	0.5	2.3 (5)	B2	5.0 (FMCL)
Xylene	0.5	17.0	D	17.0 (TO)
Site 7 Plume				
Benzene	0.5	0.5 (1)	A	1.0 (CA-MCL)
Chloromethane	0.5	3.0	C	3.0 (SNARL)
1,2-DCA	0.5	0.5 (3)	B2	0.5 (CA-MCL PQL)
1,1-DCE	0.5	6.0	C	6.0 (CA-MCL)
Cis-1,2 - DCE	0.5	6.0	D	6.0 (CA-MCL)
1,4 - DCB	0.5	0.88 (7)	C	5.0 (CA MCL)
PCE	0.5	0.7 (4)	B2	5.0 (FMCL)
TPH-D	50.0	100.0	-	100.0 (US EPA HA)
TCE	0.5	2.3 (5)	B2	5.0 (FMCL)
Vinyl Chloride	0.5	0.5 (6)	C	0.5 (CA MCL PQL)

- (1) California Environmental Protection Agency (CA EPA), Cancer Potency Factor as a Water Quality Criterion = $0.35 \mu\text{g/l}$, U. S. Environmental Protection Agency (USEPA) Integrated Risk Information System (IRIS) = $1.0 \mu\text{g/l}$
- (2) CA EPA, Cancer Potency Factor as a Water Quality Criterion = $0.23 \mu\text{g/l}$, USEPA IRIS = $0.3 \mu\text{g/l}$
- (3) CA EPA, Cancer Potency Factor as a Water Quality Criterion = $0.5 \mu\text{g/l}$, USEPA IRIS = $0.4 \mu\text{g/l}$
- (4) CA EPA, Cancer Potency Factor as a Water Quality Criterion = $0.69 \mu\text{g/l}$, USEPA IRIS = $0.7 \mu\text{g/l}$
- (5) CA EPA, Cancer Potency Factor as a Water Quality Criterion = $2.3 \mu\text{g/l}$, USEPA IRIS = $3.0 \mu\text{g/l}$
- (6) CA EPA, Cancer Potency Factor as a Water Quality Criterion = $0.13 \mu\text{g/l}$, USEPA IRIS = $0.015 \mu\text{g/l}$
- (7) CA EPA, Cancer Potency Factor = $0.88 \mu\text{g/l}$

California Regional Water Quality Control Board Central Valley Region (CVRWQB), "A Compilation of Water Quality Goals," 1993, Sacramento, California.

CA-MCL = Drinking Water Standards, California Department of Health Services, Primary Maximum Contaminant Level (MCL)

SNARL = Health Advisory or Suggested No-Adverse-Response Levels for Toxicity other than cancer risk

FMCL = Drinking Water Standards, U. S. Environmental Protection Agency, Primary MCL

US EPA HA = Health Advisories or SNARLs for toxicity other than cancer risk, U. S. Environmental Protection Agency

TO = Other Taste & Odor Thresholds

PQL = Practical Quantitation Limit

CCl₄ = carbon tetrachloride

PCE = tetrachloroethene

TCE = trichloroethene

DCA = dichloroethane

DCE = dichloroethene

TPH-G = total petroleum hydrocarbons as gasoline TPH-D = total petroleum hydrocarbons as diesel $\mu\text{g/l}$ = micrograms per liter

A = Known human carcinogen; sufficient epidemiologic evidence in humans. B2 = Probable human carcinogen; limited

epidemiologic evidence in humans. C = Possible human carcinogen; limited evidence from animal studies; no human data.

D = Not classified as to human carcinogenicity; no data or inadequate evidence.

The USAF is currently studying the potential relevance and appropriateness of SWRCB Resolution 92-49 as it pertains to USAF IRP activities within the state. The only section with substantive requirements appears to be Section IIIG. Section IIIG is the only provision of SWRCB Resolution 92-49 that arguably is relevant and appropriate in establishing water-related cleanup levels under limited circumstances yet to be determined. The portion of Section IIIG, through incorporation of certain provisions in Titles 22 and 23 CCR, that creates a presumption of media cleanup resulting in background groundwater concentration levels is not generally a relevant and appropriate requirement for groundwater or vadose zone cleanup levels. The USAF hopes to eventually resolve the ARAR status of SWRCB Resolution 92-49 through ongoing discussions with its U.S. Department of Defense counterparts, USEPA, and the state. For purposes of this ROD, the USAF believes that if vadose zone contamination overlies a groundwater plume, that remediation of the COCs in the groundwater satisfies the requirement of Section IIIG to abate the effects of discharge. In that situation, Section IIIG is not a relevant and appropriate requirement for the remediation of the vadose zone, even though technical considerations, risk, cost-effectiveness, and other remedy-selection factors may warrant concurrent remediation of the vadose zone to promote the groundwater remediation. If these factors warrant concurrent vadose zone remediation, the USAF will conduct such remediation but not based on the premise that Section IIIG requires such action.

The state's position is that SWRCB Resolution 92-49 is an applicable requirement for remedial actions in the vadose zone where there is an impact, or a threat of an impact, to the beneficial uses of the groundwater or surface waters. In such a case the state contends, SWRCB Resolution 92-49 requires remediation of the vadose zone to the lowest concentration levels of constituents technically and economically feasible, which must at least protect the beneficial uses of groundwater and surface waters, but need not be more stringent than is necessary to achieve background levels of the constituents in surface water and groundwater.

Many of the requirements for the proper handling and disposal of designated waste (23 CCR, Division 3, Chapter 15) have been incorporated through the use of the on-base ex situ bioremediation facility. This facility will first handle RCRA and/or designated waste from petroleum-only contaminated sites. These sites are, by definition, excluded from CERCLA but included within the Defense Environmental Restoration Program conducted pursuant to 10 U.S. Code Section 2701 et. seq. These provisions require that Defense Environmental Restoration Program response actions be conducted consistent with CERCLA Section 120 and guidelines, rules, and regulations (e.g., NCP), and criteria established by the USEPA. The

"petroleum only" contaminated sites were included in the RI, FFS, and Proposed Plan in a manner consistent with the Federal Facility Agreement and Defense Environmental Restoration Program. The SRWCB identified Waste Discharge Requirements (WDRs) for the operation of the ex situ bioremediation site due to the use of the site for treatment of contaminated media from the petroleum-only contaminated sites. Substantive WDRs have been developed in order to implement the portions of WDRs that are substantive requirements for treating CERCLA wastes at the ex situ bioremediation facility. Under these circumstances, the WDRs served as a means of identifying the Regional Water Quality Control Board's substantive requirements for the ex situ bioremediation facility. This expedient reference to the WDRs to identify substantive requirements is not intended to suggest that WDRs or any other form of permit are requirements for this ROD or any other CERCLA onsite response actions. The substantive WDRs are listed in Section 6.3.2.5.

6.3.2.3 State Solid Waste ARARs

The California Integrated Waste Management Act of 1989 is intended to reduce, recycle, and reuse solid waste generated in the state to the maximum extent feasible in an efficient and cost-effective manner to conserve water, energy, and other natural resources, to protect the environment, and to improve the regulations for solid waste management. Sections of the Public Resource Code which were used as a source for action-specific ARARs are presented in Table 6-6, along with the associated regulatory citations.

California Title 14: Natural Resources, Division 7, Integrated Waste Management Board; Chapter 3 - Minimum Standards for Solid Waste Management Handling and Disposal, Article 7.8 - Disposal Site Closure and Post-Closure Maintenance. Table 6-6 contains the applicable or relevant and appropriate sections of these regulations identifying the ARAR status and a brief description of the substantive requirements and applicability to either the sites, remedial action, or technology used to cleanup the site and contaminated material.

The requirements in 14 CCR 17788, ("the landfill is to be maintained and monitored for a period of not less than 30 years after completion of closure pursuant to Chapter 5, Article 3.4, Section 18265") will be applied with consideration to the facts that Site 7:

- has been dormant and inactive for approximately 30 years;
- was closed in accordance with requirements in effect at the time; and
- currently poses no threat to human health and the environment.

The requirements of 14 CCR 17788 will be met as described in the following manner.

The USAF will cap, if appropriate, the impacted area in accordance with all ARARs listed in Table 6-6. After the cap is in place the USAF will maintain and monitor the cap in accordance with 14 CCR 17788(a)(1 - 5) as long as the site presents an unacceptable risk to human health and the environment. 14 CCR 17796(c) requires that any construction improvements on the landfill sites will maintain the integrity and functioning of the landfill containment and monitoring system, and that any new activities at the site will not increase the potential threat to health, safety, and the environment.

6.3.2.4 *Other State Regulations*

The State Fish and Game Code regulates to protect aquatic life living in the waters of the state. All remedial activities that have the potential of causing a discharge to any stream lake or other body of water must comply with the requirements of the code.

Regional Water Quality Control Board, CVR Basin Plan "Disposal of Wastewater on Land Policy." This plan is a TBC to any activity that may affect water quality. The Basin Plan requires that land disposal be considered an alternative to discharges to surface waters.

Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites - this action-specific TBC recommends that soil samples from UST sites be analyzed for total petroleum hydrocarbon (TPH) as gasoline or diesel (depending upon the fuel) and BTEX. The appendix to this guideline recommends that a final remedial plan include a verification sampling program.

California Well Standards (California Department of Water Resources [DWR], Bulletin 74-90, June 1991) and Sacramento County Code, Title 6, Chapter 6.28 - The California Water Code (Chapters 1152, 1373, and 13801) requires the DWR to establish standards for the construction, operation, and abandonment of water wells, monitoring wells, and cathodic protection wells. Sacramento County has developed well construction regulations based on authority granted to the county through enforcement of the state standards. These standards should be considered as TBCs for construction of groundwater wells (injection, extraction, and monitoring).

In addition to these well standards, the guidelines provided by the California Base Closure Environmental Committee (March 1994) in "Long-Term Groundwater Monitoring Guidance" are TBCs for:

- establishing background groundwater quality;
- frequency of water level measurements;
- suite of constituents in the monitoring program;
- sampling frequency; and
- inspection and well maintenance.

Several of the California regulations require certification by a professional geologist or engineer, registered or certified by the State of California. These portions of the regulations are considered procedural rather than substantive requirements. However, to the degree that federal contractors perform and/or supervise the engineering and geotechnical work, they will be certified professional or under the supervision of certified professionals as appropriate.

6.3.2.5 State Requirements for Ex Situ Soil Bioremediation Facility

As discussed in Section 2.2.9 of this document, the USAF will operate an ex situ soil bioremediation facility onsite to treat excavated soils from Sites 56, 59, 60, 62, and 65, and other suitable sites with CERCLA contamination. Approximately 5,000 yd³ of soil from these sites are expected to be treated at the bioremediation facility. The USAF also expects to use the ex situ soil bioremediation facility for the treatment of petroleum-contaminated soils excavated from sites described in Section 4.0 that are not being addressed under the CERCLA process. Use of the bioremediation facility for the Section 4.0 sites is hereafter referred to as "Phase I operation" since this soil treatment is expected to occur prior to treatment of soils excavated from the CERCLA sites.

The bioremediation facility will consist of a single lined bioremediation cell and soil processing area. During operation of the facility during Phase I, the USAF will comply with the WDRs specified in CVRWQCB Order No. 95-221. The WDRs were derived from Title 23 CCR, Division 3, Chapter 15.

Operation of the bioremediation facility for CERCLA-related response actions (e.g., treatment and disposal of treated soils from the sites discussed in Section 2.2.9), the USAF will comply with the intent of the substantive requirements for Class II Waste Piles found in or derived from Chapter 15. Substantive requirements for this particular soil bioremediation facility and optional conditions the USAF agrees to comply with, include the following:

- The design of the bioremediation cell unit will consist of the following components from top to bottom: four to six inch cover, consisting of least

contaminated soil; six inch sand layer, or a three inch sand layer and three inches of recycled drainage rock; geotextile fabric; 30 mil PVC liner; geotextile fabric over a mostly asphalt base with some areas of native soil.

- Materials used to construct liners will have appropriate physical and chemical properties to ensure containment of discharged wastes over the operating life and closure of the bioremediation cell. All visible portions of synthetic liners will be inspected on a weekly basis.
- Materials used to construct leachate collection and removal systems (LCRSs) will have appropriate physical and chemical properties to ensure the transmission of leachate over the life of the bioremediation cell and the closure period. Leachate collection and removal systems will be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by the unit and to prevent buildup of hydraulic head on the underlying liner or underlying natural geologic materials of low hydraulic conductivity at any time. The depth of fluid in any LCRS sump will be kept at the minimum necessary for safe pump operation. The LCRS sump will be inspected three times per week for leachate generation.
- The bioremediation facility will be designed, constructed, and operated to prevent inundation or washout due to 100-year floods. The waste containment facilities and precipitation and drainage controls will be properly maintained until clean closure has been achieved.
- Waste destined for treatment will only be discharged into, and shall be confined to, the soil processing area, the bioremediation cell, or tanks specifically designed for waste containment.
- All wells within 500 feet of the unit will have sanitary seals meeting the requirements of the Sacramento County Environmental Health Management Department or will be properly abandoned.
- Accept only soils that are not classified as "hazardous waste" using the criteria in Title 22 CCR, Division 4.5, Chapter 11, for discharge to the bioremediation facility, subject to variances from hazardous waste management requirements established by the DTSC. Additionally, wastes that could potentially impair the integrity of containment structures, require a higher level of containment than provided by the unit, or which are restricted hazardous wastes will not be discharged to the bioremediation facility.
- Other than the minimum amount of water necessary for dust control and operation of the bioremediation process, the USAF will not discharge liquid, semi-solid waste (waste containing less than 50 percent solids), or solid waste containing free liquid or moisture in excess of the waste's moisture holding capacity to the bioremediation cell.

- The discharge of designated solid or liquid waste or leachate to surface water, surface water drainage courses, ponded water, or groundwater that would cause impairment to water quality is prohibited.
- Leachate and runoff from the bioremediation cell will flow into a sump where it will be pumped to a Baker tank. From storage in the Baker tank, the liquid will be used to supplement the moisture content soils that do not have sufficient moisture to support the bioremediation process.
- Waste or waste constituents from the bioremediation facility will not be discharged to natural geologic materials, groundwater, or surface waters at, beneath, or adjacent to the waste management units. This includes ponded water and areas within 100 feet of surface waters.
- Treated soils may be disposed of as "inert waste" if the following criteria are met:
 - the treated soil is not a hazardous waste as determined by criteria in 22 CCR Division 4, Chapter 11, including toxicity, ignitability, reactivity, and corrosivity;
 - TPH as gasoline and aromatic volatile organics (BTEX) are not detectable in representative samples of treated soil;
 - the leachable TPH as diesel concentration is less than 10 ug/L;
 - the metal concentrations are less than the 95 percent UCL of the background concentration calculated in the "Background Inorganic Soils Report for Mather AFB" [IT 1993f]; and
 - PAHs will not be discharged where they will be subject to erosion and transport to surface waters.
- Soil taken from the bioremediation facility and used as foundation material at Landfill Sites 3 and 4 will have total or leachable constituent concentrations equal to or less than those presented in Table 6-8. Soil not achieving these levels will be disposed at an offsite Class II Waste Disposal Facility or treated and disposed in an appropriate manner.

Table 6-8. Maximum Total or Leachable Constituent Concentrations

Constituent	Concentration
TPH-D TPH-G Oil and Grease <u>Aromatic Hydrocarbons</u> Benzene Ethylbenzene Toluene Xylene	1 mg/L Median Concentration is non-detect Maximum Concentration is 5 mg/kg 430 mg/kg Median Concentration is non-detect Maximum Concentration is 0.01 mg/kg Median Concentration is non-detect Maximum Concentration is 0.29 mg/kg Median Concentration is non-detect Maximum Concentration is 0.42 mg/kg Median Concentration is non-detect Maximum Concentration is 0.17 mg/kg
<u>Polycyclic Aromatic Hydrocarbons</u> Benzo(a)Anthracene Benzo(a)Pyrene Benzo(b)Fluoranthene Benzo(k)Fluoranthene Chrysene	0.01 mg/L 0.02 mg/L 0.02 mg/L 0.02 mg/L 0.02 mg/L
<u>Toxic Metals</u> Lead Organic Lead Manganese Chromium	1.5 mg/L 0.5 mg/kg 0.5 mg/L 0.5 mg/L

TPH-D = total petroleum hydrocarbon as diesel
TPH-G = total petroleum hydrocarbon as gasoline

mg/kg = milligrams per kilogram
mg/L = milligrams per liter

- If soil is not inert, and for discharge to a location other than Landfill Site 3 or 4, the following cleanup levels prior to removal of treated soils from the bioremediation cell will be implemented:
 - Total petroleum hydrocarbon as diesel, nonvolatiles, PAHs, lead, and/or other metals will not be present in representative samples of treated soil in soluble concentrations that will impact either surface or groundwater as determined by the DLM or an appropriate fate and transport predictive model. Soluble concentrations will be measured using the deionized water (DI) WET Method.

- Aromatic volatile organic compounds will not be detectable using analytical detection limits as close to USEPA Method Detection Limits as practicable.
- The bioremediation facility will be clean-closed after completion of use in accordance with the closure plan. At closure, all residual wastes, including liquids, sludge, precipitates, settled solids, and liner materials and adjacent natural geologic materials contaminated by wastes will be completely removed and discharged to an appropriate waste management unit.

7.0 Responsiveness Summary

The public comment period for the "Proposed Plan for the Groundwater Operable Unit Plumes and Soil Operable Unit Sites" [IT 1995b] at Mather AFB, began on May 8, 1995 and ended on June 7, 1995. A public meeting was held on May 18, 1995, at which the Proposed Plan was summarized, and questions and public comments solicited. The transcript from the public meeting is included in the Administrative Record File and reproduced here. The public submitted four formal written comments on the Proposed Plan. The written comments were from the USEPA and County of Sacramento and are included in the Administrative Record. No other comments were received during the public comment period.

Note: Sites 19, 29/B, 32, 34, 35, and 36 are sites with only petroleum contamination and are excluded from regulation under CERCLA. The USAF is not responding to comments on these sites in this ROD. Public comments on "petroleum only" sites will be considered by the CVRWQCB in approving cleanup activities at these sites.

Comment 1 and Response:

Comment:

The County is very concerned that inadequate cleanup budget, including possible cutbacks, will seriously delay environmental investigation and cleanup and in turn seriously impact productive economic reuse of the base property. The USAF must proceed diligently to assure funding for environmental cleanup and compliance within the time frames necessary for reuse. The work described in the Proposed Plan must proceed on a timely basis, or successful reuse may be jeopardized.

Response:

The USAF has and will continue to seek adequate funding for cleanup at Mather AFB for the protection of human health and the environment, and to support base reuse objectives to the best of the USAF's resources and ability consistent with USAF policy. Presently, all identified remediation requirements at Mather AFB are scheduled to receive sufficient funding necessary to implement planned remedial response actions in accordance with the ROD for the Soil OU sites and Groundwater OU plumes.

Comment 2 and Response:

Comment:

Particularly, funding should be prioritized for high priority reuse projects identified by the County. An initial list of such high priority County projects has previously been distributed and discussed with the USAF and environmental regulators. This list is attached to this letter as Exhibit A.

Response:

The USAF has reviewed the list of high priority County projects, and in the future will consider the County reuse priorities during project planning and funding prioritization. It is USAF policy to give funding priority to projects that promote rescue, after human health concerns and regulatory compliance requirements have been addressed. However, with the expectation of the County Department of Public Works Roadway Improvement and Relocation Program, the projects identified on the County Priority List have no association with any of the remedial actions proposed in this Soil OU sites and Groundwater OU plumes ROD. The Roadway Improvement and Relocation Program proposes new road construction, road realignments, and road widening which may conflict or interfere with planned remedial actions. The USAF is working with County officials to coordinate compatible remedial actions. In some instances road realignment may need to be delayed until remedial actions have been concluded. In other instances remedial actions may be designed and scheduled to allow work on roads to proceed in a timely manner.

Comment 3 and Response:

Comment:

The County is currently initiating several development projects, including demolition of existing structures, construction of new structures, utility line reallocations, and roadway improvements and relocation. New areas of contamination may be discovered as part of the County's reuse efforts. In large part due to budget issues, the County and USAF must investigate entering into a memorandum of understanding or similar arrangement, whereby the County could assist the USAF in performing site investigations/assessments and minor cleanups, to be reimbursed by the USAF. Such a relationship should be discussed and included in the Proposed Plan, and the County and USAF should continue to explore this possibility.

Response:

The comment proposes using a memorandum of understanding that would allow Sacramento County to assist in investigating and performing minor cleanups at newly discovered areas of contamination. The comment does not address itself to any of the proposed remedial alternatives in the Proposed Plan. This comment is being discussed directly with Sacramento County.

8.0 References

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EA Engineering, Science, and Technology (EA), 1990b, "Quarterly Groundwater Sampling at Mather Air Force Base, August 1990," Volume 1-Report; Volume 2-Appendix A, Appendix B, Appendix C, Pt. 1; Volume 3-Appendix C, Pt. 2; EA Engineering, Science, and Technology Corporation, Lafayette, California.

EA Engineering, Science, and Technology (EA), 1990c, "Quarterly Groundwater Sampling at Mather Air Force Base, November-December 1990," Volume 1-Report; Volume 2-Appendix A, Appendix B, Appendix C, Pt. 1; Volume 3-Appendix C, Pt. 2; EA Engineering, Science, and Technology Corporation, Lafayette, California.

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IT Corporation (IT), 1993b, "U.S. Air Force Installation Restoration Program, Final Solid Waste Assessment Test Report for Mather Air Force Base, California", Prepared by IT Corporation for Environmental Management Operations.

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IT Corporation (IT), 1994b, "Superfund Draft Final Record of Decision, Landfill Operable Unit Sites, Mather Air Force Base, Sacramento County California," Prepared by IT Corporation for Air Force Center for Environmental Excellence, Brooks Air Force Base, Texas, December 12, 1994.

IT Corporation (IT), 1994c, "Removal Action Memorandum for Sites 20, 29, and 32, Mather Air Force Base, California," Prepared by IT Corporation for Battelle Environmental Services Organization, September, 1994.

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APPENDIX A

ADMINISTRATIVE RECORD INDEX

FOR

SOIL OPERABLE UNIT SITES AND GROUNDWATER
OPERABLE UNIT PLUMES
MATHER AIR FORCE BASE,
SACRAMENTO COUNTY, CALIFORNIA

This index describes documents for the Administrative Record for the Soil OU Sites and Groundwater OU Plumes, Mather Air Force Base, Sacramento County, California. The documents described within are maintained at the Administrative Record File located in the Environmental Management Office at Headquarters (Building 2527) at Mather Air Force Base. This Administrative Record contains documents which the USAF has relied upon or considered in identifying the appropriate response action for these sites and plumes.

The Administrative Record File is available for inspection by the public during regular business hours.

Mather AFB, CA - Administrative Record Documents

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
03 Jul 80	RWQCB Letter to Base Transmitting Minutes of 10 Jun 80 Meeting Concerning Groundwater Investigation	Pinkos, Thomas R California Regional Water Quality Control Board
17 Mar 81	Internal RWQCB Memo Concerning Groundwater Investigation	Pinkos, Thomas R California Regional Water Quality Control Board
Jun 82	Phase I, Records Search Report	CH2M Hill
10 Aug 82	Base News Release "Completion of Phase I Records Search"	323 FTW/PA
04 Oct 82	RWQCB Letter to AFCEE Transmitting Comments on Records Search Report	Johnson, William S California Regional Water Quality Control Board
20 Oct 82	CA DHS Letter to Base Transmitting Interim Status Inspection Report	Stahler, James L California Department of Health Services
18 Jan 83	Phase IIA, Pre-survey Report	Engineering-Science Inc.
10 Aug 83	Phase IIB Field Evaluation SOW	US Army Corps of Engineers-Omaha District
12 Aug 83	Waste Discharge Requirements for Mather AFB, Sacramento County	Crooks, William California Regional Water Quality Control Board
03 Oct 83	RWQCB Letter to Base Concurring with Phase IIB SOW	Pinkos, Thomas R California Regional Water Quality Control Board
06 Dec 83	Memorandum of Record, Coordination Meeting with State Regulatory Agencies	Korycinski, Dennis, Capt USAF Hosp/SGPB
20 Dec 83	RWQCB Letter to Base Transmitting Summary of 6 Dec 83 Meeting	Pinkos, Thomas R California Regional Water Quality Control Board
15 Feb 84	USAF OEHL Letter to MAJCOM Transmitting Modification to Phase II SOW	Sanders, DeeAnn USAF OEHL/CVT
27 Feb 84	HQ USAF/SGPA Letter Transmitting Revised IRP Management Guidance	Kitching, Gilbert E, Col HQ USAF/SGPA
01 Aug 84	CA DHS Letter to Base Outlining State Requirements	Allen, James T California Department of Health Services
17 Aug 84	Minutes of 2 Aug 84 IRP Meeting	Slaughter, John T, Col 323 ABG/CC

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
17 Aug 84	Minutes of 6 Aug 84 TWG Meeting	Curran, James P., Capt USAF Hosp/SGPB
17 Aug 84	Minutes of 20 Aug 84 TWG Meeting	Slaughter, John T, Col 323 ABG/CC
24 Oct 84	Minutes of 1 Oct 84 TWG Meeting	Slaughter, John T, Col 323 ABG/CC
04 Dec 84	EPA Letter to Base Providing Comments on Phase I and II Documents	Seraydarian, Harry EPA Region IX
05 Dec 84	Minutes of 26 Oct 84 Meeting	Slaughter, John T, Col 323 ABG/CC
Jan 85	Phase II Stage I, Draft Final Report	Roy F. Weston, Inc
10 Feb 85	CA DHS Letter to Base Concerning Drilling Technique for Phase II Stage 3	Allen, James T California Department of Health Services
18 Apr 85	Minutes of 18 Apr 85 IRP Work Group	Bost, Thomas D, LtCol 323 ABG/CC
23 Apr 85	CA DHS Letter to Base Providing Comments on Phase II Stage 2 SOW	Karoly, BT California Department of Health Services
25 Apr 85	EPA Letter to Base Providing Comments on Proposed Phase II Stage 2 SOW	Clifford, Jerry EPA Region IX
21 May 85	CA DHS Letter to Base Providing Comments on Proposed Phase II, Stage 2 SOW	Landis, Anthony J California Department of Health Services
29 May 85	County Letter to Base Providing Comments on Draft Phase II Stage 2 SOW	Knight, K Kenneth Sacramento County Health Department
12 Jul 85	Phase II Stage 2, Confirmation/Quantification SOW	USAF Hosp/SGPB
01 Oct 85	RWQCB Letter to Base Transmitting Comments on Draft Phase II Stage 3 SOW	Matteoli, Robert J California Regional Water Quality Control Board
23 Oct 85	EPA Letter to Base Transmitting Comments on Draft Phase II Stage 3 SOW	Clifford, Jerry EPA Region IX
19 Dec 85	CA DHS Letter to Base Providing Review Comments on Phase II Stage 3 SOW	Allen, James T California Department of Health Services
02 Jan 86	Base Letter to CA DHS Concerning Progression of Phase II	Johnson, Bruce R, Col

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
15 Jan 86	CA DHS Letter to Base on Review of Phase II, Stage 1 Draft Report	Karoly, BT California Department of Health Services
06 Feb 86	RWQCB Letter to Base Transmitting Review Comments on Phase II Stage 1 Report, Off-Base Monitoring Results, and Monitoring Results on Phase II Stage 2 Wells	Pinkos, Thomas R California Regional Water Quality Control Board
06 Mar 86	CA DHS Letter to Base Transmitting Comments on Phase II Stage 1 Draft Report	Jones, Jeanine California Department of Health Services
13 Mar 86	EPA Letter to Base Providing Review Comments on Draft Phase II Stage 1 Report	Clifford, Jerry EPA Region IX
26 Mar 86	County Letter to Base Providing Review Comments on Draft Phase II Stage 1 Report	Knight, K Kenneth Sacramento County Health Department
30 Apr 86	Minutes of 3 Apr 86 Off-Base Water Supply Project Subcommittee	Johnson, Bruce R, Col 323 ABG/CC
Jun 86	Phase II Stage 1, Final Confirmation/Quantification Report, Vol I of II	Roy F. Weston, Inc.
Jun 86	Phase II Stage 1, Final Confirmation/Quantification Report, Vol II of II, Appendices	Roy F. Weston, Inc.
19 Jun 86	Base Letter to Assemblyman Providing Status of Clean-up Program	Johnson, Bruce R, Col 323 ABG/CC
27 Jun 86	Memorandum for Record Concerning Technical Advisory Group Meeting Held 25 Jun 86	Curran, James P, Capt USAF Hosp/SGPB
01 Aug 86	RWQCB Letter to Base Transmitting Comments on Phase II Stage 1 Report	Matteoli, Robert J California Regional Water Quality Control Board
08 Aug 86	CA DHS Letter to Base Advising of Deficiencies of Phase II Stage 3 QAP	McLaughlin, Charles A California Department of Health Services
05 Feb 87	RWQCB Letter to Base Providing Review Comments on Phase II Stage 2 Report	Matteoli, Robert J California Regional Water Quality Control Board
10 Feb 87	CA DHS Letter to Base Transmitting Comments on Draft Phase II Stage 2 Report	Wang, David California Department of Health Services
11 Feb 87	EPA Letter to Base Transmitting Comments on Draft Phase II Stage 2 Report	Zimpfer, Amy K EPA Region IX

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
17 Feb 87	CA DHS Letter to Base Providing Comments on Draft Phase II Stage 2 Confirmation/Quantification Report	Karoly, BT California Department of Health Services
24 Feb 87	Internal Base Letter Concerning Improper Disposal/Storage of Wastes in the 7100 Area Landfill	Curran, James P, Capt USAF Hosp/SGPB
25 Feb 87	RWQCB Letter to Base Advising of Requirement to Perform a Solid Waste Water Quality Assessment Test	Matteoli, Robert J California Regional Water Quality Control Board
21 Apr 87	SCAPCD Letter to Base on Screening Questionnaire for Inactive Solid Waste Disposal Sites	Skelton, Eric P Sacramento County Air Pollution Control District
Jun 87	Phase II Stage 2, Final Confirmation/Quantification Report, Vol I of II	Aerovironment Inc.
Jun 87	Phase II Stage 2, Final Confirmation/Quantification Report, Vol II of II	Aerovironment Inc.
03 Jun 87	Assembly California Legislature Letter to Base on Subjects Discussed at Toxic Contamination Cleanup Meeting	Connelly, Lloyd G California Legislative Assembly
12 Jun 87	Base Letter to Technical Advisory Committee Members on Initial Coordination Meeting	Johnson, Bruce R, Col 323 ABG/CC
30 Jun 87	Base Letter to USAF OEHL/ECQ on Landfill Gas Testing	Curran, James P, Capt USAF Hosp/SGPB
17 Jul 87	Base Letter to County Air Pollution Control District on Proposed Gas Testing Plan	Johnson, Bruce R, Col 323 ABG/CC
27 Aug 87	CA DHS Letter to Base on Phase II Stage 3, Draft Confirmation/Quantification Report	Karoly, BT California Department of Health Services
27 Aug 87	RWQCB Letter to Base on Phase II Stage 3 Groundwater Investigation Report	Matteoli, Robert J California Regional Water Quality Control Board
28 Aug 87	EPA Letter to Base on Phase II Stage 3, Draft Report	Zimpfer, Amy K EPA Region IX
14 Sep 87	EPA Letter to Base on Phase II Stage 2, Final Confirmation/Quantification Report	Zimpfer, Amy K EPA Region IX
15 Oct 87	RWQCB Letter to Base on Solid Waste Assessment Test Waiver Denial	Matteoli, Robert J California Regional Water Quality Control Board
22 Dec 87	Minutes of 15 Dec 87 TRC Meeting	Kosovac, Don E, Col 323 FTW/EM

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
Jan 88	Phase II Stage 3, Confirmation/Quantification Report	Aerovironment Inc.
13 Jan 88	County Letter to Contractor Approving Draft Landfill Gas Testing Work Plan	Skelton, Eric P Sacramento County Air Pollution control District
26 Jan 88	Private Citizens Well Sampling Data	California Regional Water Quality Control Board
27 Jan 88	Final Landfill Gas Testing Work Plan	IT Corporation
09 Feb 88	Minutes of 27 Jan 88 Mini TRC Meeting	Kosovac, Don E, Col 323 FTW/EM
10 Mar 88	County Letter to Resident at 3901 Bradshaw Rd., Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 10212 Ellenwood Avenue, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 10122 Ellenwood Avenue, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 97 21 Farm Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 9910 Old Placerville Rd., Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 9847 Old Placerville Rd., Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 9938 Old Placerville Rd., Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 9960 Old Placerville Rd., Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 9970 Old Placerville Rd., Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 4075 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
10 Mar 88	County Letter to Resident at 4016 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 4095 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 4001 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 3990 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 3951 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 4106 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 4274 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 4294 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 3851 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 3900 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 3960 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
10 Mar 88	County Letter to Resident at 4070 Happy Lane, Sacramento, CA Transmitting Analysis of Well Water Sample	Cermak, James Sacramento County Health Department
11 Apr 88	Declaration for Proof of Publication, Notice of Release of Phase II Stage 3 Report and 20 Apr 88 Public Meeting	Graham, Barbara L The Sacramento Union
11 Apr 88	Public Meeting Notice on Phase II Stage 3	323 FTW/PA

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
14 Apr 88	Minutes of 22 Mar 88 TRC Meeting	Kosovac, Don E, Col 323 FTW/PA
15 Apr 88	Base Letter to MAJCOM Transmitting EPA Comments on Draft IAG	Kosovac, Don E, Col 323 FTW/PA
13 May 88	EPA Letter to Base Transmitting Comments on Phase II Stage 3 Final Confirmation/Quantification Report	Anderson, Julie EPA Region IX
14 Jun 88	MAJCOM Letter to EPA Providing Responses to EPA Comments on Phase II Stage 3 Final Report	Saenz, Jose L, LtCol HQ ATC/DEEV
30 Jun 88	Minutes of 30 Jun 88 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
Jul 88	Landfill Gas Testing Report for Eight Sites	IT Corporation
29 Jul 88	Phase IVA, Well Redevelopment and Sampling Plan	IT Corporation
15 Aug 88	RWQCB Letter to Base Providing Comments on Well Redevelopment and Sampling Plan	Guadagnino, Philip G California Regional Water Quality Control Board
17 Aug 88	CA DHS Letter to Base Transmitting Review Comments on Revised Well Redevelopment and Sampling Plan, 29 Jul 88	Wang, David California Department of Health Services
18 Aug 88	EPA Letter to MAJCOM Transmitting Comments on Well Redevelopment and Sampling Plan, 29 Jul 88	Seid, Raymond EPA Region IX
30 Nov 88	Minutes of 6 Oct 88 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
07 Dec 88	RWQCB Letter to MAJCOM Providing Comments on Draft RI/FS Work Plan Documents	Matteoli, Robert J California Regional Water Quality Control Board
08 Dec 88	EPA Letter to MAJCOM Transmitting Review Comments on RI/FS Draft Work Plans	Chestnutt, John D EPA Region IX
29 Dec 88	CA DHS Letter to MAJCOM Transmitting Review Comments on RI/FS Draft Work Plans	Wang, David California Department of Health Services
06 Mar 88	Minutes of 12 Jan 89 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
05 Apr 89	EPA Letter to SAF/RQ Concerning IAG Negotiations	Zelikson, Jeffrey EPA Region IX
26 Apr 89	CA DHS Letter to Base Concerning Monitoring Well Sampling	Wang, David California Department of Health Services

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
Apr 89	Mather AFB Community Relations Plan	Wimberly, Cathryn 323D Flying Training Wing, Public Affairs
May 89	Base Newsletter, "IRP Update"	323 FTW/EM
01 May 89	Minutes of 6 Apr 89 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
Jul 89	Base Newsletter, "IRP Community Update"	323 FTW/EM
10 Jul 89	Transcript of 10 Jul 89 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.
13 Jul 89	Phase II Stage 2, SOW, Confirmation/Quantification	USAF OEHL/TSS
20 Jul 89	Minutes of 10 Jul 89 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
03 Oct 89	Transcript of 3 Oct 89 TRC Meeting	Peters, Ronald J Peters Shorthand Reporting Corp.
18 Oct 89	RWQCB Letter to Base Providing Review Comments on SWAT Report	Matteoli, Robert J California Regional Water Quality Control Board
13 Nov 89	Minutes of 3 Oct 89 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
29 Nov 89	RWQCB Letter to CA DHS Providing Review Comments on RI/FS Draft Site Inspection Report	Matteoli, Robert J California Regional Water Quality Control Board
30 Nov 89	Transcript of 30 Nov 89 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.
01 Dec 89	CA DHS Letter to Base Providing Comments on RI/FS Draft Site Inspection Report	Landis, Anthony J California Department of Health Services
Dec 89	Mather AFB Community Relations Plan	Wimberly, Cathryn 323D Flying Training Wing, Public Affairs
03 Jan 90	RWQCB Letter with Review Comments to CA DTSC on Draft RI/FS Work Plan	Matteoli, Robert J. California Regional Water Quality Control Board
12 Jan 90	EPA Letter to MAJCOM Transmitting Review Comments on the Nov 89 RI/FS Draft Work Plans	Chestnutt, John D EPA Region IX

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
16 Jan 90	Internal RWQCB Memo Providing Review Comments on RI/FS Draft Sampling and Analysis Plan for Identified Sites	Mosbacher, Michael H California Regional Water Quality Control Board
30 Jan 90	Transcript of 30 Jan 90 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.
14 Feb 90	EPA Letter to Base Transmitting Comments on Draft Final CRP	Chestnutt, John D EPA Region IX
20 Feb 90	Sampling and Analysis Report for Site Monitoring Wells, Oct/Nov 88	IT Corporation
07 Mar 90	Minutes of 30 Jan 90 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
08 Mar 90	Transcript of 8 Mar 90 TRC Meeting	Peters, Ronald J Peters Shorthand Reporting Corp.
23 Mar 90	Minutes of FFA 8 Mar 90 Project Managers Meeting	Blank, Richard A, LtCol 323 FTW/EM
Apr 90	Draft Final RI/FS, Group 2 Sites Work Plan, Vol I of IV Sampling and Analysis Plan, Vol II of IV Quality Assurance Project Plan, Vol III of IV Health and Safety Plan Vol IV of IV	IT Corporation
10 May 90	Transcript of 10 May 90 TRC Meeting	McNulty, Bernadette Peters Shorthand Reporting Corp.
17 May 90	CA DHS Letter to Base Concerning Finalization of RI/FS Draft Final Work Plans, Group 2 Sites	Landis, Anthony J California Department of Health Services
21 May 90	EPA Letter to Base Concerning RI/FS Draft Final Work Plans, Group 2 Sites	Chestnutt, John D EPA Region IX
25 May 90	Minutes of 10 May 90 TRC Meeting	Blank, Richard A., LtCol 323 FTW/EM
01 Jun 90	RWQCB Letter to CA DHS Providing Comments on No Further Action Decision Documents, LF-01, FT-08, FT-09, FT-10, RW-16, WP-17, OT-21, OT-22	Mosbacher, Michael H California Regional Water Quality Control Board
20 Jun 90	CA DHS Letter to Base Providing Comments on No Further Action Decision Documents, LF-01, FT-08, FT-09, FT-10, RW-16, WP-17, OT-21, OT-22	Billington, Tracie L California Department of Health Services

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
20 Jun 90	EPA Letter to Base Providing Comments on No Further Action Decision Documents, LF-01, FT-08, FT-09, FT-10, RW-16, WP-17, OT-21, OT-22	Chestnutt, John D EPA Region IX
Jul 90	No Further Action Decision Document, LF-01	323 FTW/EM
Jul 90	No Further Action Decision Document, FT-08	323 FTW/EM
Jul 90	No Further Action Decision Document, FT-10	323 FTW/EM
Jul 90	No Further Action Decision Document, RW-16	323 FTW/EM
Jul 90	No Further Action Decision Document, ST-33	323 FTW/EM
Jul 90	No Further Action Decision Document, ST-35	323 FTW/EM
Jul 90	No Further Action Decision Document, ST-36	323 FTW/EM
Jul 90	No Further Action Decision Document, ST-37	323 FTW/EM
Jul 90	No Further Action Decision Document, ST-38	323 FTW/EM
Jul 90	No Further Action Decision Document, ST-40	323 FTW/EM
Jul 90	No Further Action Decision Document, ST-41	323 FTW/EM
Jul 90	No Further Action Decision Document, ST-42	323 FTW/EM
Jul 90	No Further Action Decision Document, ST-43	323 FTW/EM
Jul 90	No Further Action Decision Document, ST-44	323 FTW/EM
Jul 90	No Further Action Decision Document, ST-45	323 FTW/EM
25 Jul 90	RI/FS, QAPP Addendum	IT Corporation
Aug 90	No Further Action Decision Document, WP-17	323 FTW/EM
Aug 90	No Further Action Decision Document, FT-09	323 FTW/EM
Aug 90	No Further Action Decision Document, OT-21	323 FTW/EM
Aug 90	No Further Action Decision Document, OT-22	323 FTW/EM
Aug 90	RI/FS, Final Site Inspection Report	IT Corporation
02 Aug 90	Transcript of 2 Aug 90 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.
31 Aug 90	CA DHS Letter to Base Providing Comments on FS Draft Work Plan, AC&W Site, and RI/FS QAPP Addendum, Group 2 and AC&W Sites	Diebert, Donn California Department of Health Services
06 Sep 90	Minutes of 2 Aug 90 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
19 Sep 90	CA DHS Letter to Base Providing Comments on RI/FS Solid Waste Water Quality Assessment Test, Draft Project Plans Addendum, Group 2 Sites	Wang, David California Department of Health Services
19 Sep 90	EPA Letter to Base Providing Comments on RI Draft Work Plan Addendum, Group 2 Sites	Chestnutt, John D EPA Region IX
23 Oct 90	Transcript of 23 Oct 90 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.
Nov 90	RI/FS, Solid Waste Water Quality Assessment Test, Draft Final Project Plans Addendum, Group 2 Sites	IT Corporation
07 Nov 90	CA DHS Letter to Base Approving Dual Completion Groundwater Monitoring Wells	Billington, Tracie L California Department of Health Services
09 Nov 90	MAJCOM Letter to EPA Transmitting No Further Action Decision Documents and Response to Regulatory Comments	Sizemore, Daniel L, LtCol HQ ATC/DEEV
15 Nov 90	Transcript of 15 Nov 90 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.
19 Nov 90	Minutes of 23 Oct 90 TRC Project Managers Meeting	Blank, Richard A, LtCol 323 FTW/EM
28 Nov 90	CA DHS Letter to Base Concerning Final Site Inspection Report and FS Draft Final Work Plan, AC&W Site	Wang, David California Department of Health Services
29 Nov 90	Minutes of 15 Nov 90 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
19 Dec 90	EPA Letter to Base Providing Conditional Approval of Draft Final Project Plans Addendum for Group 2 Sites	Chestnutt, John D EPA Region IX
26 Dec 90	CA DHS Letter to Base Approving Draft Final Project Plans Addendum for Group 2 Sites	Wang, David California Department of Health Services
30 Jan 91	Transcript of 30 Jan 91 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.
Feb 91	Routine Groundwater Monitoring Project Plans: QAPP, and SAP	IT Corporation
14 Feb 91	Minutes of 30 Jan 91 TRC Project Managers Meeting	Blank, Richard A, LtCol 323 FTW/EM

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
15 Feb 91	RWQCB Letter to Base Transmitting Comments on Draft Final Project Plans Addendum, Group 2 Sites	Mosbacher, Michael H California Regional Water Quality Control Board
28 Mar 91	Transcript of 28 Mar 91 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.
15 Apr 91	Minutes of 28 Mar 91 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
May 91	Quarterly Groundwater Monitoring Report, Mar 91	IT Corporation
01 May 91	CA DHS Letter to Base Providing Comments on Draft Routine Groundwater Monitoring Project Plan	Wang, David California Department of Health Services
15 May 91	EPA Letter to Base Providing Comments on 31 Mar 91 Routine Groundwater Monitoring Program Project Plans	Moore, Katherine L EPA Region IX
21 May 91	Transcript of 21 May 91 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.
23 May 91	RWQCB Letter to Base Providing Comments on Routine Groundwater Monitoring Program Project Plans	Mosbacher, Michael H California Regional Water Quality Control Board
29 May 91	EPA Letter to Base Concerning Proposed Schedule of Primary Documents in the FFA	Moore, Katherine L EPA Region IX
18 Jun 91	Minutes of 21 May 91 TRC Meeting	Blank, Richard A, LtCol 323 ABG/EM
25 Jun 91	Transcript of 25 Jun 91 Project Managers' Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.
Jul 91	Quarterly Groundwater Monitoring Report, June 91	IT Corporation
02 Jul 91	EPA Letter to Base Providing Comments on Quarterly Groundwater Monitoring Report, Mar 91	Moore, Katherine L EPA Region IX
25 Jul 91	Minutes of 25 Jul 91 Project Managers Meeting	Blank, Richard A, LtCol 323 ABG/EM
20 Aug 91	Transcript of 20 Aug 91 TRC Meeting	Parks, Nadine J Peters Shorthand Reporting Corp.
Sep 91	Quarterly Groundwater Monitoring Report, Third Quarter 91	IT Corporation

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
17 Sep 91	Minutes of 20 Aug 91 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
16 Oct 91	EPA Letter to Base Providing Comments on Jul 91 Quarterly Groundwater Monitoring Report	Moore, Katherine L EPA Region IX
24 Oct 91	Minutes of 25-26 Sep 91 Project Managers Meeting	Blank, Richard A, LtCol 323 FTW/EM
06 Nov 91	CA DTSC Letter to Base Providing Comments on Draft CRP	Billington, Tracie L California Department of Toxic Substances Control
12 Nov 91	EPA Letter to Base Providing Comments on QAPP, Group 3 Sites	Moore, Katherine L EPA Region IX
20 Nov 91	CA DTSC Letter to Base Transmitting Comments on RI/FS Project Plans, Group 3 Sites	Billington, Tracie L California Department of Toxic Substances Control
20 Nov 91	RWQCB Letter to Base Providing Comments on Draft Work Plan and Sampling and Analysis Plan for Group 3 Sites	Mosbacher, Michael H California Regional Water Quality Control Board
21 Nov 91	Minutes of 21 Nov 91 TRC Meeting	Bailey, Doris M Peters Shorthand Reporting Corp.
03 Dec 91	Minutes of 21 Nov 91 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
03 Dec 91	EPA Letter to Base Transmitting Comments on Third Quarter 1991 Groundwater Monitoring Report	Moore, Katherine L EPA Region IX
Jan 92	Quarterly Groundwater Monitoring Report, Fourth Quarter 91	IT Corporation
Jan 92	Draft Final CRP	IT Corporation
Jan 92	Draft Final RI, Group 3 Sites Work Plan, Vol I of IV Sampling and Analysis Plan, Vol II of IV Quality Assurance Plan, Vol III of IV Health and Safety Plan, Vol IV of IV	IT Corporation
08 Jan 92	EPA Letter to Base on Review of Background Soils Sampling Strategy	Moore, Katherine L EPA Region IX
08 Jan 92	U.S. EPA's comments on the Base Soils Management Plan	Moore, Katherine L EPA Region IX

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
23 Jan 92	Minutes of 9 Jan 92 RPM Meeting	Blank, Richard A, LtCol 323 FTW/EM
20 Feb 92	EPA Letter to Base on Review of Draft Final Group 3 Work Plan and Sample and Analysis Plan	Moore, Katherine L EPA Region IX
02 Mar 92	RWQCB Letter to Base Concerning Review of Final Work Plan for Group 3 Sites	Vorster, Antonia KJ California Regional Water Quality Control Board
10 Mar 92	EPA Letter to Base Commenting on Fourth Quarter 91 Groundwater Monitoring Report	Moore, Katherine L EPA Region IX
11 Mar 92	Transcript of 11 Mar 92 TRC Meeting	Nicol, Janet H Peters Shorthand Reporting Corp.
17 Mar 92	CA DTSC Letter to Base Providing Revised Appendix D, FFA	Billington, Tracie L California Department of Toxic Substances Control
24 Mar 92	Memorandum for Record: Information Provided to Off-Base Residents Regarding Documented Groundwater Contamination Beneath Their Residence	Evans, Brent A 323 FTW/EM
27 Mar 92	Minutes of 11 Mar 92 RPM Meeting	Blank, Richard A, LtCol 323 FTW/EM
27 Mar 92	Minutes of 11 Mar 92 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
May 92	Field Investigation Final Work Plan, Vol I of IV SAP; QAPP; Health and Safety Plan, Vol II, III, and IV of IV	IT Corporation
May 92	Groundwater Monitoring Program Project Plans, SAP, Vol I; QAPP, Vol II; Health and Safety Plan, Vol III	IT Corporation
06 May 92	EPA Letter to Base on Review of RI, Draft Group 2 Report	Moore, Katherine L EPA Region IX
27 May 92	California Integrated Waste Management Board comments on the Group 2 Remedial Investigation Report	Zielinski, Tamara California Integrated Waste Management Board
Jun 92	Draft Subsurface Soil Investigation, UST Removal Project	IT Corporation
03 Jun 92	Minutes of 3 Jun 92 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
04 Jun 92	First Quarter Groundwater Monitoring Report	Battelle Environmental Management Operations
09 Jun 92	EPA Letter to Base on Review of the First Quarter Groundwater Monitoring Report	Swarthout, Brian EPA Region IX
15 Jun 92	CA DTSC Letter to Base with Comments on RI, Group 2 Report	Billington, Tracie L California Department of Toxic Substances Control
01 Jul 92	FS, Draft Work Plan, Groundwater and Soil OU	Battelle Environmental Management Operations
06 Jul 92	Minutes of 3 Jun 91 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
20 Jul 92	EPA comments on "Soils and Groundwater Operable Unit Additional Field Investigation Plans"	Moore, Katherine L EPA Region IX
20 Jul 92	EPA comments on "First Quarter 1992 Ground Water Monitoring Report"	Moore, Katherine L EPA Region IX
27 Jul 92	CA DTSC Letter to Base on Groundwater Monitoring Program	Billington, Tracie L California Department of Toxic Substances Control
28 Jul 92	Transcript of 28 Jul 92 TRC Meeting	Medeiros, Vicki L Peters Shorthand Reporting Corp.
07 Aug 92	Quarterly Groundwater Monitoring Report, Second Quarter 1992	IT Corporation
10 Aug 92	CA DTSC Letter to Base on Additional Field Investigation Work Plan	Billington, Tracie L California Department of Toxic Substances Control
28 Aug 92	RWQCB Letter to Base on Draft Additional Field Investigation Work Plan for Soil and Groundwater OUs	Mosbacher, Michael H California Regional Water Quality Control Board
18 Sep 92	EPA Letter to Base Transmitting Comments on Draft Groundwater OU and Soil OU Focused FS Work Plan	Moore, Katherine L EPA Region IX
18 Sep 92	EPA Letter to Base on Focused FS, Draft Work Plan for Groundwater and Soil OUs	Moore, Katherine L EPA Region IX
21 Sep 92	CA DTSC Letter to Base on Focused FS, Draft Work Plan for Groundwater and Soil OUs	Billington, Tracie L California Department of Toxic Substances Control

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
22 Sep 92	RWQCB Letter to Base on Focused FS, Draft Work Plan for Groundwater and Soil OUs	Mosbacher, Michael H California Regional Water Quality Control Board
30 Sep 92	EPA Letter to Base on Second Quarter 92 Groundwater Monitoring Report	Moore, Katherine L EPA Region IX
08 Oct 92	Transcript of 8 Oct 92 TRC Meeting	Nicol, Janet H Peters Shorthand Reporting Corp.
09 Oct 92	EPA Letter to Base Transmitting Comments on RI Report, Group 2 Sites	Moore, Katherine L EPA Region IX
28 Oct 92	Focused FS, Draft Final Work Plan, OU-2 and OU-3	IT Corporation
29 Oct 92	CA DTSC Letter to Base Providing Comments on Draft Groundwater Monitoring Program Evaluation	Billington, Tracie L., California Department of Toxic Substances Control
29 Oct 92	EPA Letter to Base Providing Comments on Draft Groundwater Monitoring Program Evaluation	Moore, Katherine L EPA Region IX
06 Nov 92	Quarterly Groundwater Monitoring Report, Third Quarter 92	IT Corporation
10 Nov 92	Letter from DTSC regarding Draft Solid Waste Assessment Test Report	Billington, Tracie L., California Department of Toxic Substances Control
12 Nov 92	EPA Letter to Base Transmitting Comments on Chapter 6 and Missing Appendices, RI Report, Group 2 Sites	Moore, Katherine L EPA Region IX
18 Nov 92	RWQCB Notice of Public Hearing Concerning Invoking A Formal Dispute Over Soil Cleanup	Pearson, Lawrence J California Regional Water Quality Control Board
18 Nov 92	EPA Letter to Base Transmitting Comments on Draft Final Soils and Groundwater OU Additional Field Investigation Work Plan, SAP, and QAPP	Moore, Katherine L EPA Region IX
18 Nov 92	Focused FS, Draft Final Work Plan, OU-2 and OU-3	IT Corporation
24 Nov 92	CA DTSC Letter to MAJCOM Invoking Dispute Resolution on Draft Final "...Soils and Groundwater OU Additional Field Investigation..."	Wang, David California Department of Toxic Substances Control
27 Nov 92	Minutes of 8 Oct 92 TRC Meeting	Blank, Richard A, LtCol 323 FTW/EM
27 Nov 92	Minutes of 8/9 Oct 92 RPM Meeting	Blank, Richard A, LtCol 323 FTW/EM

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
30 Nov 92	CA DTSC Letter to Base Transmitting Comments on Comprehensive Baseline Risk Assessment, Draft Work Plan, Sep 92	Billington, Tracie L California Regional Water Quality Control Board
09 Dec 92	Minutes of 1 Dec 92 Meeting to Resolve the Additional Field Investigation Work Plan Dispute	Mosbacher, Michael H California Regional Water Quality Control Board
10 Dec 92	Transcript of 10 Dec 92 TRC Meeting	Medeiros, Vicki L Peters Shorthand Reporting Corp.
17 Dec 92	Notification of invocation of Resolution 92-236 by RWQCB and initiating formal dispute concerning soil cleanup levels	Crooks, William California Regional Water Quality Control Board
18 Dec 92	EPA Letter to Base Concerning Draft Final Groundwater OU and Soil OU Focused FS Work Plan	Moore, Kathrine L EPA Region IX
18 Dec 92	EPA Letter to Base Commenting on Third Quarter 92 Groundwater Monitoring Report	Moore, Kathrine L EPA Region IX
22 Dec 92	RWQCB Letter to Base Providing Comments on Draft Groundwater Monitoring Program Evaluation	Mosbacher, Michael H California Regional Water Quality Control Board
22 Dec 92	RWQCB comments on the Base Soils Management Plan	Mosbacher, Michael H California Regional Water Quality Control Board
24 Dec 92	DTSC Comments on Background Soil Sampling Strategy	Billington, Tracie L California Department of Toxic Substances Control
30 Dec 92	RWQCB comments on Background Soil Sampling Strategy	Mosbacher, Michael H California Regional Water Quality Control Board
Jan 93	Draft Final Work Plan, Comprehensive Baseline Risk Assessment	IT Corporation
12 Jan 93	Brian Swarthout's replacement by Debbie Lowe, U.S. EPA	Greg Baker, U.S. EPA Region IX
08 Feb 93	Quarterly Groundwater Monitoring Report, Fourth Quarter 92	IT Corporation
26 Feb 93	EPA Letter to Base on FFA Schedule	Moore, Katherine L EPA Region IX
Mar 93	Final Solid Waste Assessment Test Report, volumes 1-2	IT Corporation

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
08 Mar 93	EPA Letter with Comments to Base on Quarterly Groundwater Monitoring Report, Fourth Quarter	Moore, Katherine L EPA Region IX
19 Mar 93	RWQCB Letter with Comments to Base on Quarterly Groundwater Monitoring Report, Fourth Quarter	Williams, Camilla California Regional Water Quality Control Board
25 Mar 93	Transcript of 25 Mar 93 RPM Meeting	Bailey, Doris M Peters Shorthand Reporting Corp.
26 Mar 93	Transcript of 26 Mar 93 TRC Meeting	Nicol, Janet H Peters Shorthand Reporting Corp.
Apr 93	Draft Final RI, Group 2 Sites 12 volumes	Battelle Environmental Management Operations
16 Apr 93	RWQCB Letter to Base Concerning Additional Field Investigation Consensus Statement	Williams, Camilla California Regional Water Quality Control Board
May 93	Final Groundwater Monitoring Program Evaluation (of 1992 data, to plan for sampling in 1993)	IT Corporation
03 May 93	Request for Historical Data on use of Pesticides and Herbicides	Blank, Richard A, LtCol 323D Flying Training Wing
12 May 93	Additional Groundwater Plume Mapping Report	Robinson, Dennis IT Corp
18 May 93	EPA Draft Comments on Draft Comprehensive Baseline Risk Assessment	Christopher, John P EPA Region IX
20 May 93	Map Folio, Additional Groundwater Plume Maps	Battelle Environmental Management Operations
21 May 93	CA DTSC Letter to Base Transmitting Comments on Groundwater Monitoring Program SAP, and QAPP	Strong, Kent California Department of Toxic Substances Control
24 May 93	RWQCB Letter to Base Transmitting Comments on Groundwater Monitoring Program Project Plans	Williams, Camilla California Regional Water Quality Control Board
02 Jun 93	Quarterly Groundwater Monitoring Report, First Quarter 93	IT Corporation
07 Jun 93	EPA Letter to Base Transmitting Comments on Appendix A of Draft Final Comprehensive Baseline Risk Assessment Work Plan and Background Soils Sampling Strategy	Swarthout, Brian EPA Region IX

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
07 Jun 93	RWQCB Letter to Base Providing Comments on Draft Final Work Plan, Appendix A: Background Soils and Groundwater Sampling Strategy	Taylor, James D California Regional Water Quality Control Board
15 Jun 93	Minutes, 21 May 1993 Remedial Project Manager's Meeting	AFBCA/OL-D
18 Jun 93	CA DTSC Letter to Base Providing Comments on Final Groundwater Monitoring Program Evaluation	Strong, Kent California Department of Toxic Substances Control
25 Jun 93	Modification of Site 7 Extraction Test	Smith, Charles H. AFBCA/OL-D
28 Jun 93	Proposed Revision to Appendix D to Federal Facility Agreement	Smith, Charles H. AFBCA/OL-D
Jul 93	Final Base Soils Management Plan	IT Corporation
07 Jul 93	CA DTSC Letter to Base on Draft Technical Memorandum Group 3 Sites	Strong, Kent California Department of Toxic Substances Control
09 Jul 93	EPA Letter with Comments to Base on Draft Technical Memorandum Group 3 Sites	Swarthout, Brian EPA Region IX
09 Jul 93	RWQCB Letter with Comments to Base on Draft Technical Memorandum Group 3 Sites	Williams, Camilla California Regional Water Quality Control Board
16 Jul 93	CA DTSC Letter to Base on Draft Final Work Plan, Appendix A, Groundwater and Soil Sampling	Strong, Kent California Department of Toxic Substances Control
30 Jul 93	EPA Letter to Base on Draft Technical Memorandum Group 3 Sites	Swarthout, Brian EPA Region IX
Jul 93	IRP Data Summary	IT Corporation
Aug 93	Draft Final Work Plan, Comprehensive Baseline Risk Assessment	IT Corporation
10 Aug 93	CA DTSC Letter to Base on Draft Technical Memorandum Group 3 Sites	Strong, Kent California Department of Toxic Substances Control
16 Aug 93	CA DTSC Letter to Base on Draft Technical Memorandum Group 3 Sites	Strong, Kent California Department of Toxic Substances Control
17 Aug 93	Quarterly Groundwater Monitoring Report, Second Quarter 93	IT Corporation
20 Aug 93	Minutes, 27 July 1993 Remedial Project Manager s' (BCT) Meeting	AFBCA/OL-D

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
08 Sep 93	Recommendation to Initiate Sampling for Off-Base Water Supply Wells	Smith, Charles H. AFBCA/OL-D
22 Sep 93	RWQCB Letter to Base on Draft Final Work Plan, Comprehensive Baseline Risk Assessment	Williams, Camilla California Regional Water Quality Control Board
23 Sep 93	Revised Appendix D to Mather AFB FFA	Smith, Charles H. AFBCA/OL-D
24 Sep 93	EPA Letter to Base on Draft Final Work Plan, Comprehensive Baseline Risk Assessment	Swarthout, Brian EPA Region IX
01 Oct 93	CA DTSC Letter with Comments to Base on Draft EE/CA Report, ST-20, ST-29, and ST-32	Strong, Kent California Department of Toxic Substances Control
04 Oct 93	CA DTSC Memorandum with Comments on Draft EE/CA Report, ST-20, ST-29, and ST-32	Vest, Mark D California Department of Toxic Substances Control
13 Oct 93	Transcript of 13 Oct 93 TRC Meeting	Nicol, Janet H Peters Shorthand Reporting Corp.
28 Oct 93	EPA Letter to Base on Draft Final Technical Memorandum for Group 3 Sites	Swarthout, Brian EPA Region IX
04 Nov 93	CA DTSC Letter to Base on Draft Final Technical Memorandum Group 3 Sites	Strong, Kent California Department of Toxic Substances Control
05 Nov 93	Request for Information on Wells Near Mather AFB	Smith, Charles H. AFBCA/OL-D
12 Nov 93	Quarterly Groundwater Monitoring Report, Third Quarter 93	IT Corporation
Dec 93	Final EE/CA Report, ST-20, ST-29, and ST-32	IT Corporation
06 Dec 93	CA DTSC Letter to Base Providing Comments on the Background Inorganic Soils Report	Strong, Kent California Department of Toxic Substances Control
08 Dec 93	RWQCB Letter to Base Providing Comments on the Background Inorganic Soils Report	Williams, Camilla California Regional Water Quality Control Board
10 Dec 93	CA DTSC Letter to Base Transmitting Guidance on Decommissioning Monitoring Wells	Strong, Kent California Department of Toxic Substances Control

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
06 Jan 94	Mather AFB Giant Garter Snake Survey Report	Hildreth, Jane The Earth Technology Corporation
10 Jan 94	CA DTSC Letter to Base Transmitting Comments on Draft Final EE/CA, ST-20, ST-29, ST-32	Strong, Kent California Department of Toxic Substances Control
18 Jan 94	EPA Letter with Review Comments to AFBDA/NW-D on EE/CA, ST-20, ST-29, ST-32	Lowe, Debbie EPA Region IX
19 Jan 94	State and Federal Concurrence that Draft Final Engineering Evaluation and Cost Analysis Report is Final	Strong, Kent California Department of Toxic Substances Control
01 Feb 94	State's comments on Draft Proposed Plan for Environmental Cleanup at Three Sites on Mather AFB (sites 29, 30, and 32)	Strong, Kent California Department of Toxic Substances Control
07 Feb 94	Draft Groundwater and Soil Operable Unit Focused Feasibility Study, U.S.-EPA's Comments	Lowe, Debbie EPA Region IX
08 Feb 94	State's acceptance of submittal schedule for Revised Closure Plan for Storage and Treatment Facility	Crandall, Robert California Department of Toxic Substances Control
15 Feb 94	RWQCB transmittal of Department of Health Services comments on Draft and Preliminary Final Basewide Environmental Baseline Survey for Mather	Williams, Camilla California Regional Water Quality Control Board
18 Feb 94	Quarterly Groundwater Monitoring Report, Fourth Quarter 93	IT Corporation
28 Feb 96	Mather Air Force Base Consensus Statement extending finalization of Revised Draft Final Soil and Groundwater Operable Units Record of Decision to 5 March 1996.	Anthony C. Wong, AFBCA Debbie Lowe, U.S. EPA Kent Strong, CA DTSC
Feb 94	Proposed Plan for Environmental Cleanup at Three Sites on Mather Air Force Base	Smith, Charles AFBCA/OL,D
01 Mar 94	Revised Appendix D to Mather AFB Federal Facility Agreement	Smith, Charles H AFBCA/OL-D
11 Mar 94	State's comments on Draft 1994 Groundwater Monitoring Program Project Plans	Strong, Kent California Department of Toxic Substances Control
23 Mar 94	RWQCB Letter to Base Concerning No Further Action Sites, and Additional Field Investigation Dispute	Williams, Camilla California Regional Water Quality Control Board

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
12 Apr 94	Recommended Approach for Groundwater Discharges	Harader, Sam County of Sacramento, Water Quality Division
Apr 94	Draft Final 93 Groundwater Monitoring Program Evaluation Report	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 3271	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 3385	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 3389	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 3975	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 8175	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 10015	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 8158	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 10065	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 10400 & 10400A	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 10450	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 1226	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 18011	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 18018	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 8157	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 18020	IT Corporation
May 94	Closure Report, UST Removal Project, Bldg 10030	IT Corporation
May 94	1994 Groundwater Monitoring Program Project Plans, SAP, HSP, Vol I, and II	IT Corporation
May 94	Additional Field Investigation, Soil Management Report	IT Corporation
12 May 94	Quarterly Groundwater Monitoring Report, First Quarter 94	IT Corporation
16 May 94	U.S.-EPA's request that the Comprehensive Baseline Risk Assessment be submitted as two volumes, i.e., human health risk assessment and the ecological risk assessment	Lowe, Debbie EPA Region IX
16 May 94	State's request for FFA extension for Draft Comprehensive Baseline Risk Assessment	Strong, Kent California Department of Toxic Substances Control

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
18 May 94	State's comments on Draft Comprehensive Baseline Risk Assessment	Strong, Kent California Department of Toxic Substances Control
19 May 94	U.S.-EPA's comments on Draft Removal Action Memorandum	Lowe, Debbie EPA Region IX
20 May 94	State's comments on Preliminary Draft Removal Action Memorandum	Strong, Kent California Department of Toxic Substances Control
31 May 94	State's comments on Draft Final 1993 Groundwater Monitoring Program Evaluation Report	Strong, Kent California Department of Toxic Substances Control
Jun 94	Interim Soil Management Report, UST, Vol I of III	IT Corporation
Jun 94	Interim Soil Management Report, UST, Vol II of III	IT Corporation
Jun 94	Interim Soil Management Report, UST, Vol III of III	IT Corporation
03 Jun 94	Focused FS, Report, OU-2 and OU-3, Vol I of IV	IT Corporation
14 Jun 94	IT Corporation's Request to DTSC for Surrogate Toxicity Values for the Comprehensive Baseline Risk Assessment (CBRA)	Dove, Harvey, PhD IT Corporation
16 Jun 94	IT Corporation's Strawman Outline for Additional Ecological Risk Assessment Sampling	Dove, Harvey, PhD IT Corporation
17 Jun 94	Groundwater Sampling Program for Off-Base Supply Wells	Smith, Charles H. AFBCA/OL,D
17 Jun 94	U.S.-EPA's summary of key items regarding the Comprehensive Baseline Risk Assessment meeting of 10 June 1994	Lowe, Debbie EPA Region IX
23 Jun 94	Draft Groundwater and Soil Operable Units Additional Field Investigation Remedial Investigation Report	Taylor, James California Regional Water Quality Control Board
23 Jun 94	RWQCB Letter to CA DTSC Providing Comments on Draft Additional Field Investigation Report	Taylor, James D California Regional Water Quality Control Board
24 Jun 94	EPA Letter to Base Providing Comments on Draft RI Additional Field Investigation Report	Lowe, Debbie EPA Region IX
24 Jun 94	CA DTSC Letter to Base Providing Comments on Draft RI Additional Field Investigation Report	Strong, Kent California Department of Toxic Substances Control
29 Jun 94	U.S.-EPA's comments on the Strawperson Outline for Additional Ecological Sampling	Lowe, Debbie U.S. EPA Region IX

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
06 Jul 94	Private well sampling results from 06-07 June 1994	Long, G. Cornell Armstrong Laboratory, Occupational and Environmental Health Directorate
12 Jul 94	Access to Off-Base Monitoring Wells for 3rd Quarter 1994	Wong, Anthony C. AFBCA/OL,D
14 Jul 94	U.S. EPA's concerns for discussion at 19 July 94 meeting on program strategy and relationship of the Additional Field Investigation, Focused Feasibility Study, and Risk Assessment reports	Lowe, Debbie EPA Region IX
14 Jul 94	Air Force notes on U.S.-EPA's letter of 14 Jul 94	Hughes, William Operational Technologies
18 Jul 94	U.S.-EPA requests extension for Draft Final Comprehensive Baseline Risk Assessment Report	Lowe, Debbie EPA Region IX
18 Jul 94	Air Force request for extension of Draft Final Comprehensive Baseline Risk Assessment Report	Wong, Anthony AFBCA/OL,D
19 Jul 94	Air Force request for extension for Draft Final Removal Action Memorandum	Wong, Anthony AFBCA/OL,D
19 Jul 94	U.S.-EPA's comments on Oil/Water Separator Decontamination and Removal and RCRA Closure of Hazardous Waste Storage Facilities: Site-Specific Sampling and Analysis Plan, Site-Specific Health and Safety Plan, and Site-Specific Construction Quality Plan	Lowe, Debbie EPA Region IX
Aug 94	RI, Final Additional Field Investigation Report for Soil and Groundwater OUs: Vol I, Text, Appendices A-B Vol II of VI, Appendix C Vol III of VI, Appendices D-F Vol IV of VI, Appendices G-L Vol V of VI, Appendix M Vol VI of VI, Appendix M (cont'd)	IT Corporation
10 Aug 94	03 August 1994 Laboratory Documentation Requirements for Validation of Organic Data by BC Laboratories, Inc. 3 volumes	Long, Cornell Armstrong Laboratory, Occupational and Environmental Health Directorate
12 Aug 94	Quarterly Groundwater Monitoring Report, Second Quarter 94	IT Corporation
18 Aug 94	Request for Extension, Draft Final Comprehensive Baseline Risk Assessment Report	Wong, Anthony C. AFBCA/OL,D

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
18 Aug 94	RPM Consensus on Draft Comprehensive Baseline Risk Assessment (CBRA) data gaps and renaming CBRA to Mather Baseline Risk Assessment (MBRA)	Smith, Charles AFBCA/OL,D
19 Aug 94	Preliminary Summary Tables for Comprehensive Baseline Risk Assessment Revised Risk Estimates	IT Corporation
23 Aug 94	<i>Proposed Scope for Additional Field Investigation sent to RPMs</i>	Wong, Anthony AFBCA/OL,D
23 Aug 94	EPA Letter to CA DTSC on Removal Action Memorandum, ST-20, ST-29, and ST-32	Lowe, Debbie EPA Region IX
26 Aug 94	State's request for 16 day extension for review of Draft Soil and Groundwater Focused Feasibility Study	Strong, Kent California Department of Toxic Substances Control
26 Aug 94	EPA Letter with Review Comments of Focused FS Report, OU-2 and OU-3, Vol I, Appendices G, I and K	Hagemann, Matthew EPA Region IX
29 Aug 94	Course of Action to Finalize Removal Action Memorandum for Sites 29, 29, and 32	Wong, Anthony EPA Region IX
30 Aug 94	U.S.-EPA addresses State's request for 16 and 30 day extensions for review of the Draft Soil and Groundwater OU Focused Feasibility Study	Lowe, Debbie U.S. EPA Region IX
31 Aug 94	EPA Letter to SWRCB on Proposed ARARs, ST-20	Estrada, Thelma K EPA Region IX
Sep 94	Removal Action Memorandum, ST-20, ST-29, and ST-32	IT Corporation
02 Sep 94	CA DTSC Letter to EPA on Proposed ARARs, ST-20	Small, Suzanne California Department of Toxic Substances Control
09 Sep 94	Sacramento Metropolitan Air Quality Management District's reduction in oversight time for remedial activities at military bases	DeGuzman, Jorge Sacramento Metropolitan Air Quality Management District
12 Sep 94	Response to Agency Comments and Revised Response to Comments on the Removal Action Memorandum	Marks, Barbara IT Corporation
16 Sep 94	Draft Groundwater and Soil Operable Units Focused Feasibility Study, DTSC Comments	Strong, Kent California Department of Toxic Substances Control
19 Sep 94	Removal Action Memorandum and Response to Comments	Wong, Anthony AFBCA/OL,D
23 Sep 94	Mather Baseline Risk Assessment (MBRA) Suggested Changes and Effects on the Groundwater and Soil Operable Unit Focused Feasibility Study	Lowe, Debbie EPA Region IX

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
26 Sep 94	Documentation from RWQCB officially replacing Cam Williams with James Taylor as Project Manager	Vorster, Antonia California Regional Water Quality Control Board
28 Sep 94	Draft Mather Baseline Risk Assessment, Revised Comment Resolution	Dove, F. Harvey, Ph.D., P.H. IT Corporation
28 Sep 94	Historical Trends for the Past Two Years of Selected Analytes, Mather AFB Quarterly Groundwater Sampling, Second Quarter 1994	Hughes, Bill OpTech
21 Oct 94	Transmittal of Revised Scope of Work for Upcoming Additional Field Investigation	Smith, Charles H. AFBCA/OL-D
21 Oct 94	Quarterly Groundwater Monitoring Report, Third Quarter 94, OU-2	IT Corporation
Nov 94	RCRA Closure of Permitted Hazardous Waste Facilities, QPP	Ogden Environmental and Energy Services
09 Nov 94	Comment Responses on the Draft Groundwater and Soil Operable Units Focused Feasibility Study	IT Corporation
10 Nov 94	04 October 1994 BCT Meeting Minutes	AFBCA/OL-D
17 Nov 94	DTSC transmittal of RWQCB's statement of applicability of Resolution 92-49	Strong, Kent California Department of Toxic Substances Control
21 Nov 94	Clarification of Proposed Tasks in Phase II Detailed Ecological Risk Assessment	Meyers-Shone, Linda IT Corporation
07 Dec 94	Teleconference notes from conversation held on 28 November 1994 with Air Force, regulators, and IT Corp on the proposed Mather Phase II Ecological Risk Assessment Work	Meyers-Shone, Linda IT Corporation
09 Dec 94	Interim Wellhead Protection Strategy - Citizens Utility Well at Explorer Drive (DWR identification 8N/6E-9B)	Smith, Charles H. AFBCA/OL-D
12 Dec 94	Final Landfill OU ROD (relevant to disposal of treated or otherwise non-designated soils from Soils Operable Unit)	AFBCA
15 Dec 94	Air Force extension request for Groundwater OU and Soil OU Draft Final Focused Feasibility Study Report and Proposed Plan	Wong, Anthony AFBCA/OL-D
21 Dec 94	Draft Petroleum Exclusion Language for the Soil and Groundwater Operable Units Focused Feasibility Study	Lowe, Debbie U.S. EPA Region IX

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
21 Dec 94	Solicitation of State ARARs	Strong, Kent California Department of Toxic Substances Control
Dec 94	Draft Final Technical Plans and Quality Program Plan for Site 29	Montgomery Watson Americas, Inc
04 Jan 95	Review of Closure Reports for 41 USTs	Smith, Charles H. AFBCA/OL-D
09 Jan 95	U.S.-EPA's partial comments on Draft Technical Plans for Site 29, Draft Quality Program Plan for Soil Treatment at Old RV Storage Areas, and Draft Quality Program Plan for Site 29	Lowe, Debbie EPA Region IX
09 Jan 95	State's comments on Draft Technical Plans for Site 29, Draft Quality Program Plans for Site 29 and Old RV Storage Area	Strong, Kent California Department of Toxic Substances Control
17 Jan 95	U.S.-EPA's comments on Draft Environmental Operation and Maintenance Plan for the Soil Bioremediation at the Old RV Storage Area	Lowe, Debbie EPA Region IX
17 Jan 95	U.S.-EPA's suggested language on "what is risk" to be implemented in the Soil and Groundwater Proposed Plan	Lowe, Debbie U.S. EPA Region IX
18 Jan 95	ARARS for Site 7	Zielinski, Tamara California Integrated Waste Management Board
18 Jan 95	Proposed Change, Analytical Method for Metals, Groundwater Monitoring	Wong, Anthony C. AFBCA/OL-D
23 Jan 95	ARARs for Groundwater at Mather AFB	Morehouse, Jess, Jr California Department of Health Services
23 Jan 95	ARARS Identified by Sacramento Metropolitan Air Quality District	DeGuzman, Jorge Sacramento Metropolitan Air Quality District
23 Jan 95	U.S. EPA's comments on Quality Program Plan, Volume IV: Sampling and Analysis Plan	Lowe, Debbie EPA Region IX
24 Jan 95	U.S.-EPA's comments on Draft Quality Program Plan for Soil Treatment at the Old RV Storage Area, Section 3, Sampling and Analysis Plan	Lowe, Debbie EPA Region IX
25 Jan 95	15 November 1995 BCT Meeting Minutes	AFBCA/OL-D
25 Jan 95	U.S.-EPA's comments on Draft Technical Plans for Site 29 from EPA's Kerr Laboratories in Ada, Oklahoma	Lowe, Debbie EPA Region IX

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
31 Jan 95	Montgomery Watson Meeting Notes of 10-11 January BCT Meeting, Agenda Item #2	Scott, John D. Montgomery Watson Americas, Inc
31 Jan 95	Revised Section 2.8 of the Draft Technical Plans for Site 29	Scott, John D. Montgomery Watson Americas, Inc
03 Feb 95	Data and Cost Analysis for Groundwater and Soil Focused Feasibility Study	IT Corporation
07 Feb 95	Draft Groundwater Soil Operable Unit Focused Feasibility Study, U.S.-EPA's Comments	Lowe, Debbie USEPA IX
07 Feb 95	Groundwater and Soils Operable Unit Focused Feasibility Study State ARARs	Strong, Kent California Department of Toxic Substances Control
07 Feb 95	State's comments on Draft Technical Plans for Site 20	Strong, Kent California Department of Toxic Substances Control
07 Feb 95	Preliminary Evaluation of Economic Impacts Resulting from Modification of Preliminary Remediation Goals for the Groundwater Plumes at Mather AFB	IT Corp (transmitted informally as "white paper" for discussion)
08 Feb 95	Comments from DTSC, RWQCB, and IWMB on the Draft Final Groundwater and Soil Operable Units Focused Feasibility Study	Strong, Kent California Department of Toxic Substances Control Taylor, James California Regional Water Quality Control Board Zielinski, Tamara California Integrated Waste Management Board
09 Feb 95	Requested Extension, Groundwater OU and Soil OU Draft Proposed Plan	Wong, Anthony C. AFBCA/OL-D
10 Feb 95	Quarterly Groundwater Monitoring Report, Fourth Quarter 94	IT Corporation
10 Feb 95	Results of Preliminary Evaluation to the Groundwater and Soil OU Sites Pursuant to the Technical and Economic Feasibility of Resolution 92-49	Robinson, Dennis IT Corporation
10 Feb 95	Quarterly Groundwater Monitoring Report, Fourth Quarter 1994	IT Corporation

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
14 Feb 95	U.S.-EPA's comments on Draft Technical Plans and Quality Program Plans for Site 20	Lowe, Debbie EPA Region IX
16 Feb 95	AFBCA's request for extension of Groundwater OU and Soil OU Draft Final Focused Feasibility Study	Wong, Anthony AFBCA/OL-D
20 Feb 95	Requested Extension, Groundwater OU and Soil OU Draft Final Focused Feasibility Study Report	Wong, Anthony C. AFBCA/OL-D
21 Feb 95	U.S.-EPA's comments on Section 2.8, Technical Plans for Site 29	Lowe, Debbie
23 Feb 95	U.S.-EPA's comments on Draft Phase II Ecological Risk Assessment Work Plan	Lowe, Debbie
27 Feb 95	U.S.-EPA's comments on the 1995 Groundwater Monitoring Program Project Plans	Lowe, Debbie EPA Region IX
27 Feb 95	Preliminary Evaluation of Economic Impacts Resulting from Modification of Preliminary Remediation Goals for the Soil OU and the Groundwater Plumes at Mather AFB	IT Corp
Mar 95	Final 1994 Groundwater Monitoring Program Evaluation Report for Mather Air Force Base	IT Corporation
Mar 95	US-EPA, DTSC Mather Air Force Base Fact Sheet	California Department of Toxic Substances Control
01 Mar 95 08 Mar 95	Public Comments on Draft Proposed Plan for Groundwater and Soil Operable Units	Mathes, Charles Lunceford, Sandra Mead, Kathleen
06 Mar 95	State's comments on Draft Technical Plan and Quality Program Plan for Site 32, Soil Excavation and Bioremediation	Strong, Kent California Department of Toxic Substances Control
08 Mar 95	Proposed Revisions to Site 20 Sample Analysis Plan	Scott, John Montgomery Watson Americas, Inc
10 Mar 95	U.S.- EPA's comments on Draft Technical Plans and Quality Program Plans for Site 32	Lowe, Debbie EPA Region IX
16 Mar 95	Northeast Plume Discussion Paper re: Groundwater and Soil Operable Unit Focused Feasibility Study	Wong, Anthony AFBCA/OL-D
16 Mar 95	Request for a Schedule Extension for the Soil and Groundwater OU Focused Feasibility Study	Robinson, Dennis IT Corporation
17 Mar 95	Cleanup Criteria and Monitoring for VOC's Discussion Paper for Draft Groundwater and Soils Operable Unit Focused Feasibility Study	Taylor, James California Regional Water Quality Control Board

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
20 Mar 95	"White Paper" for Groundwater and Soil Operable Units (OU-2, OU-3) Focused Feasibility Study	Wong, Tony AFBCA/OL-D
27 Mar 95	Final Groundwater and Soil Operable Units Focused Feasibility Study, Vol. 1-4	IT Corporation
27 Mar 95	28 February 1995 BCT Meeting Minutes	AFBCA/OL-D
30 Mar 95	State's comments on Soil Gas "White Paper"	Strong, Kent California Department of Toxic Substances Control
06 Apr 94	EPA comments on Draft Construction Package, SVE, and Bioventing Systems for Site 29	Lowe, Debbie EPA Region IX
12 Apr 95	Solicitation of Applicable or Relevant and Appropriate Requirements (ARARs) for the Groundwater and Soil Operable Units Focused Feasibility Study	Wong, Anthony AFBCA/OL-D
18 Apr 95	Draft Final Phase II Detailed Ecological Risk Assessment Work Plan for Groundwater and Soils OU	IT Corporation
21 Apr 95	Responses to Comments on Specifications and Drawings for Site 29	Montgomery Watson Americas, Inc
May 95	Proposed Plan for Groundwater and Soil Operable Units	IT Corporation
May 95	Draft Final 1995 Groundwater Monitoring Program Project Plans, SAP, and Health and Safety Plan	IT Corporation
May 95	Draft Final Technical Plans and Quality Program Plan for Site 29	Montgomery Watson Americas, Inc
May 95	Working Draft Copy of the Proposed Plan for the Soil Excavation Removal Actions Planned at Seven Sites	AFBCA/OL-D
01 May 95	Public Notice for Groundwater and Soil Proposed Plan Comment Period and Meeting Date in the "Grapevine Independent";	Grapevine Independent
03 May 95	Public Notice for Groundwater and Soil Proposed Plan Comment Period and Meeting Date in the "Sacramento Bee"	Sacramento Bee
03 May 95	Access to Off-Base Monitoring Wells for First Quarter 1995	Wong, Anthony C. AFBCA/OL-D
18 May 95	Public Meeting Minutes for the Proposed Environmental Cleanup Plan for the Groundwater and Soil Operable Unit Sites	Parks, Nadine Peters Shorthand Reporting Corporation
25 May 95	Quarterly Groundwater Monitoring Report, First Quarter 1995	IT Corporation

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
26 May 95	Quality Program Plan for Mather AFB	Montgomery Watson Americas, Inc
30 May 95	DTSC Approval of Closure Plan, Class 2 Modification	Pappas, James California Department of Toxic Substances Control
06 Jun 95	EPA Commentary on Draft Final Installation Restoration Program 1995 Groundwater Monitoring Program Project Plans	Lowe, Debbie EPA Region IX
06 Jun 95	US-EPA Region IX Comments on the Proposed Plan for Groundwater and Soil Operable Units	Lowe, Debbie EPA Region IX
07 Jun 95	Sacramento County Comments on Proposed Plan for Groundwater and Soil Operable Units	Yim, Randall Yim, Okun & Watson
07 Jun 95	DTSC ARARs for the Groundwater and Soil Operable Units Record of Decision	Strong, Kent California Department of Toxic Substances Control
12 Jun 95	RWQCB comments on accepting Soil and Groundwater Focused Feasibility Study, but wants to address certain issues within the Soil and Groundwater OU ROD	Taylor, James California Regional Water Quality Control Board
14 Jun 95	31 May - 01 June 1995 BCT Meeting Minutes	Lunceford, Sandra Gutierrez-Palmenberg, Inc
16 Jun 95	California Regional Water Quality Control Board's Concerns with Groundwater and Soil Operable Units FFS to be Further Addressed in the Groundwater and Soil ROD	Taylor, James California Regional Water Quality Control Board
27 Jun 95	Air Force Review of ARARs on Draft Mather Groundwater and Soil Operable Units ROD	Rupe, Sam C., LtCol Department of the Air Force, Office of the Regional Counsel/Western Region
Jun 95	Final Construction Package Soil Extraction and Bioventing Systems for Site 29	Scott, John Montgomery Watson Americas, Inc
Jun 95	Draft Final Technical Plan and Quality Program Plan for Site 32.	Montgomery Watson Americas, Inc
Jun 95	Draft Final Technical Plan and Quality Program Plan for Site 20	Montgomery Watson Americas, Inc
12 Jul 95	Cal-EPA's comments on the Draft Remedial Investigation, Additional Site Characterization for the Soil and Groundwater OUs	Strong, Kent California Department of Toxic Substances Control

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
14 Jul 95	US-EPA request for extended review of Remedial Investigation, Additional Site Characterization, and Remedial Design Support Draft Work Plan	Lowe, Debbie EPA Region IX
20 Jul 95	1995 Groundwater Sampling Frequency Adjustment	Smith, Charles H. AFBCA/OL-D
21 Jul 95	Dioxin and Furan Sampling Request in the Draft Remedial Investigation, Additional Site Characterization, and Remedial Design Work Plan	Strong, Kent California Department of Toxic Substances Control
25 Jul 95	12-13 July 1995 BCT Meeting Minutes	Lunceford, Sandra Gutierrez-Palmenberg, Inc
28 Jul 95	EPA Request for Extension for Review and Comment on Mather Baseline Risk Assessment	Lowe, Debbie EPA Region IX
Aug 95	Final Operations and Maintenance Manual for Site 29, Soil Vapor Extraction System	Montgomery Watson Americas, Inc.
Aug 95	Quarterly Groundwater Monitoring Report, Second Quarter 95	IT Corporation
04 Aug 95	Access to Off-Base Monitoring Wells for Third Quarter 1995	Smith, Charles H. AFBCA/OL-D
30 Aug 95	U.S. EPA request for 14-day extension for review, comment and approval of Draft Final Mather Baseline Risk Assessment and review and comment on Draft Soil and Groundwater ROD	Lowe, Debbie EPA Region IX
31 Aug 95	Approval of Extension for Review of Draft Final Mather Baseline Risk Assessment to 15 Sep 1995	Smith, Charles H AFBCA/OL-D
07 Sep 95	29-30 August 1995 BCT Meeting Minutes	Lunceford, Sandra Gutierrez-Palmenberg, Inc
12 Sep 95	Review Comments from State Regarding Draft Operations and Maintenance Manuals for Site 29 Soil Vapor Extraction and Bioventing Systems	Strong, Kent California Department of Toxic Substances Control
12 Sep 95	Aircraft Fuel Storage Facility, Site 19, oversight jurisdiction by RWQCB and use by Trajen, Inc.	Strong, Kent California Department of Toxic Substances Control
12 Sep 95	Discharge of Water from South Digester Tank at Old Treatment Plant	Freeman, Kirk County of Sacramento, Water Quality Division
12 Sep 95	Request for Extension for Review of the Draft Final Mather Baseline Risk Assessment	Strong, Kent California Department of Toxic Substances Control

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
15 Sep 95	EPA Comments on Draft Groundwater and Soil Operable Units Record of Decision	Lowe, Debbie EPA Region IX
15 Sep 95	Draft Groundwater and Soil Operable Units Record of Decision Comments from State of California	Strong, Kent California Department of Toxic Substances Control Taylor, James California Regional Water Quality Control Board
18 Sep 95	Comments on Revised Proposed Waste Discharge Requirements (WDRs) for Soil Bioremediation Unit	Rupe, Sam, LtCol Office of the Regional Counsel Western Region Dept. of Air Force
19 Sep 95	U.S. EPA approval of State's 12 Sept 95 request for 21-day extension for review of the Draft Final Mather Baseline Risk Assessment. EPA notes the Air Forces's concern that the Record of Decision may need to be extended as a result of this extension.	Lowe, Debbie EPA Region IX
29 Sep 95	27-28 September 1995 BCT Meeting Minutes	Lunceford, Sandra Gutierrez-Palmenberg, Inc
05 Oct 95	Draft Final Mather Baseline Risk Assessment (MBRA) Comments from EPA Region IX	Lowe, Debbie Callahan, Clarence A., PhD Serda, Sophia, PhD EPA Region IX
06 Oct 95	Mather Baseline Risk Assessment, Comments from California Department of Toxic Substances Control	Strong, Kent California Department of Toxic Substances Control
12 Oct 95	Submission of Emissions Verification Reports #2 and #3 for SVE System at Site 29	Cabrol, Steven G. Montgomery Watson Americas, Inc
30 Oct 95	RWQCB's fax about Additive Toxicity Criterion for Soil and Groundwater ROD	Taylor, James California Regional Water Quality Control Board
31 Oct 95	Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for Morrison Creek Mining Reach Upstream (North) of Jackson Highway, transmitted by letter dated 26 Dec 95 from Catherine Hack, Sacramento County Department of Environmental Review and Assessment	Sacramento County Department of Environmental Review and Assessment, and U.S. Army Corps of Engineers
Oct 95	Draft Final Operations and Maintenance Manual for Site 29, Bioventing System	Montgomery Watson Americas, Inc

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
Nov 95	Quarterly Groundwater Monitoring Report, Third Quarter 95	IT Corporation
Nov 95	Draft Addendum to the Draft Final Sampling and Analysis Plan for the Basewide Groundwater Monitoring Program	Montgomery Watson Americas, Inc
13 Nov 95	Transmittal of 2 U.S. EPA memoranda on CERCLA reform and remedy selection	Yonkers, Terry AFBCA/DR
14 Nov 95	07-08 November 1995 BCT Meeting Minutes	Lunceford, Sandra Gutierrez-Palmenberg, Inc
20 Nov 95	State's request for additional review time for the Draft Final Mather Baseline Risk Assessment and the Draft Final Soils Operable Unit and Groundwater Operable Unit Record of Decision, to allow for presentation of the issues to the RWQCB.	Strong, Kent California Department of Toxic Substances Control
22 Nov 95	Comments from the State on Additional Site Characterization Contract Modification, Draft Work Plan Addendum	Strong, Kent California Department of Toxic Substances Control
22 Nov 95	U.S. EPA addresses State's request for a 15 day extension for review of the Draft Final Soil and Groundwater ROD	Lowe, Debbie EPA Region IX
22 Nov 95	U.S. EPA's Request for Extended Review of Additional Site Characterization Work Plan Addendum	Lowe, Debbie EPA Region IX
28 Nov 95	Mather AFB Comments on Draft ROD for Soil and Groundwater Operable Units	Smith, Charles H AFBCA/OL-D
29 Nov 95	Draft Final Soils Operable Unit and Groundwater Operable Unit Record of Decision Request for Delivery Extension	Strong, Kent California Department of Toxic Substances Control
01 Dec 95	US-EPA Request for Extension for Review of Additional Site Characterization Work Plan Addendum	Lowe, Debbie EPA Region IX
05 Dec 95	U.S. EPA's comments on Draft Additional Site Characterization Addendum Work Plan	Lowe, Debbie EPA Region IX
05 Dec 95	Explorer Well Maintenance Program	Strong, Kent California Department of Toxic Substances Control
07 Dec 95	State will not pursue previously requested 15 day extension request for California Draft Final Soil and Groundwater ROD	Strong, Kent California Department of Toxic Substances Control
12 Dec 95	Transmittal of EPA Guidance on Technical Impracticability ARAR Waivers ,and on Groundwater Contamination with Suspected DNAPLs	Rupe, Sam, LtCol AFLSA/JACE-WR

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
13 Dec 95	Request for Extension for Community Relations Plan	Smith, Charles H. AFBCA/OL-D
18 Dec 95	Comments on Draft 1995 Groundwater Monitoring Program Evaluation Report (GWMPEP)	AFBCA/OL-D
18 Dec 95	Request for Document Extension for Record of Decision for Soil Operable Unit Sites and Groundwater Operable Unit Plumes	AFBCA/OL-D
Dec 95	Draft Report of Analytical Results, Site 20 Characterization Investigation	Montgomery Watson Americas, Inc
Dec 95	Draft Technical Plans and Quality Program Plan for Removal Actions for Soil Operable Unit Sites 56, 59, 60, 62, and 65	Montgomery Watson Americas, Inc
27 Dec 95	State's concurrence with Air Force's request for extension of Draft Final Soil and Groundwater ROD	Strong, Kent California Department of Toxic Substances Control
Jan 96	Additional Site Characterization for Groundwater, Soil, and Basewide Operable Units, vol. 1-4 (Final Work Plan, SAP, QAPP, and Health and Safety Plan)	IT Corporation
10 Jan 96	09-10 Jan 1996 BCT Meeting Minutes	Sandra Lunceford Gutierrez-Palmenberg, Inc
11 Jan 96	Use of Dioxin contaminated Soil for Landfill 4 Cap Foundation Construction	Strong, Kent California Department of Toxic Substances Control
12 Jan 96	Purge Testing of Citizens Utility Company of California Explorer Well	Wong, Anthony C. AFBCA/OL-D
16 Jan 96	Draft Final 1995 Groundwater Monitoring Program Evaluation Report	IT Corporation
16 Jan 96	Comments to Draft Report, Resource Conservation and Recovery Act (RCRA) Closure	Crandall, Robert A. California Department of Toxic Substances Control
18 Jan 96	Draft Final Record of Decision Soil Operable Unit Sites and Groundwater Operable Unit Plumes	IT Corporation
18 Jan 96	U.S. EPA's comments on Addendum to the Sampling and Analysis Plan for the Basewide Groundwater Monitoring Program	Lowe, Debbie EPA Region IX
19 Jan 96	SVE System at Site 29	Fow, Carol Montgomery Watson

Mather AFB, CA - Administrative Record Documents (Continued)

DOC. DATE	SUBJECT OR TITLE	AUTHOR or CORP. AUTHOR
25 Jan 96	Transmittal of Draft Final Community Relations Plan	Wong, Anthony C. AFBCA/OL-D
02 Feb 96	Petroleum Cleanup Policy Changes	Knight, Robert County of Sacramento Hazardous Materials Program
7 Feb 96	Draft Final Work Plan Addendum, Additional Site Characterization Contract Modification	IT Corporation
14 Feb 96	Comment Responses from Ogden Environmental for Final Oil Water Separator Removal and RCRA Closure of Hazardous Waste Facility	Scher, Patrick Ogden Environmental and Energy Services
16 Feb 96	Revised Draft Final Record of Decision, Soil Operable Unit Sites and Groundwater Operable Unit Plumes	AFBCA/OL,D
16 Feb 96	State's comments on Draft Report of Analytical Results Site 20 Characterization Investigation	Strong, Kent California Department of Toxic Substances Control
18 Apr 96	Transmittal of 8 April Agreement Resolving "Informal Dispute" on Revised Draft Final Soil and Groundwater ROD	Stan R. Phillipe California Department of Toxic Substances Control
29 Apr 96	Completion of Plume Extent Estimates for 27 Sep 95 Letter	Anthony C. Wong AFBCA/OL,D